

TO: HONORABLE CITY COUNCIL
FROM: GREEN RIBBON TASK FORCE
DATE: DECEMBER 18, 2006
SUBJECT: REPORT OF MAYOR'S GREEN RIBBON TASK FORCE ON CLIMATE PROTECTION

Attached please find the final report of the Mayor's Green Ribbon Task Force on Climate Protection.

The report is being provided early for the December 18, 2006 study session.

REPORT OF MAYOR'S GREEN RIBBON TASK FORCE ON CLIMATE PROTECTION

THE CHALLENGE

In a lead article in the Perspective Section of the *Mercury-News* on April 9, entitled “Why We Need To Worry About Global Warming Now,” author Ross Gelbspan stated the following:

“In 1995, a panel of the world’s leading climate scientists declared that unless humanity cuts its use of coal and oil by 70 percent over the next hundred years, the world will suffer significant disruptions from global warming toward the end of this century.

“Just six years later, that same body, the UN-sponsored Intergovernmental Panel on Climate Change (IPCC) declared that warming had ‘already affected physical and biological systems’ in many areas of the world. The news that at least some damage was happening faster than predicted was alarming; the United Nations’ top environmental official said it ‘should sound alarm bells in every national capital.’

“In January, the famed British ecologist James Lovelock declared that we have already passed the ‘point of no return.’ Others, including NASA’s James Hansen, think we still have about a 10-year grace period in which to make major changes.

“Rajendra Pachauri, head of the IPCC, also sees a 10-year timeline and says that dramatic cuts in carbon fuel must be made ‘if humanity is to survive.’ And British climate expert Peter Cox says: ‘The scientific agenda has moved from improving projections to thinking about...the chances of something awful happening.’

“Why the new urgency? Planetary changes that were supposed to occur toward the end of the century...are actually happening today.

“[as just one] example, the Greenland ice sheet, one of the largest glaciers on the planet, is melting from above and losing its stability as meltwater from the surface trickles down and lubricates the bedrock on which the ice sheet sits. Should that ice sheet slide into the ocean, it would raise sea levels on the order of 20 feet.”

THE CONTEXT

In June 2005, the Governor signed an Executive Order establishing aggressive goals for the State of California to address global climate change, and declared, “*The debate is over. We know the science. We see the threat. And we know the time for action is now.*”

The California Climate Action Team Report to Governor Schwarzenegger and the California Legislature, released in March 2006, includes in its findings and recommendations the following quotations:

- Climate change is widely recognized by scientists throughout the world to be one of the most daunting challenges of our time.

- Although there is some uncertainty about exactly how and when the earth's climate will respond to increasing concentrations of climate change emissions, observations—in conjunction with climate models—indicate that detectable changes are underway.
- All of these changes could have significant adverse effects on water resources and ecological systems, as well as on human health and the economy.
- Implementation of precautionary and proactive measures is imperative if climate change emissions are to be reduced and communities are to adapt successfully to adverse impacts.

More recently, the State Legislature passed and the Governor signed into law AB 32, the California Global Warming Solutions Act of 2006, which declares that global warming poses a serious threat to the economic well-being, public health, natural resources, and the environment of California.

Palo Alto has long taken a leadership role in addressing environmental issues. In 1999, the City of Palo Alto adopted the Santa Clara County Green Government Pledge to lead by example by improving its own environmental performance, and is currently pursuing recertification. In 2001, the City of Palo Alto adopted a Sustainability Policy to strive to be a sustainable community—one which meets its current needs without compromising the ability of future generations to meet their own needs.

The City is already actively involved in several programs that either directly or indirectly seek to reduce greenhouse gas emission, including utility programs to foster energy efficiency and renewable energy, the Zero Waste strategic plan, use of alternative fuels, commute programs, and encouraging green building. The City is an active participant in Sustainable Silicon Valley, is a member of the California Climate Action Registry, and the Mayor has signed the U.S. Mayors' Climate Protection Agreement, which as of June 2006 has been signed by 238 mayors in the United States. In 2006, the City of Palo Alto endorsed the California Publicly Owned Electric Utilities' Principles Addressing Greenhouse Reduction Goals, and the utilities department has already included development of a climate action plan in the electric utilities long-term energy resource plan.

Local actions are critical to achieving state goals to address a global problem. Local government actions taken to reduce greenhouse gas emissions and increase energy efficiency can provide multiple local benefits by decreasing air pollution, creating jobs, reducing energy expenditures, and saving money for the local government, its businesses, and its residents. The challenge is to take tangible steps and lead the way in encouraging businesses and residents to do the same.

APPOINTMENT AND OPERATION OF THE TASK FORCE

Responding to the challenge of global warming, Mayor Judy Kleinberg stated in her 2006 State of the City address that she would establish a Green Ribbon Task Force on Climate Protection, serving the Palo Alto/Stanford community, to “better galvanize our

community to work on the problem of climate change and greenhouse gas emissions, and to recommend tangible steps and local actions by all stakeholder groups, including the City, to reduce global warming and encourage sustainable practices.”

The initial members of the Task Force (TF) were appointed by the Mayor, with assistance from former Mayor Jim Burch. In her invitation to join, Mayor Kleinberg stated her expectations of the group: “I anticipate that the group will adopt a mission statement [and] work plan, and then develop climate protection recommendations from which each stakeholder group will develop action plans based on benchmarks, goals and objectives. Progress toward goals would be reported annually, preferably around Earth Day, in a community-wide Palo Alto/Stanford Green Index or Report Card.”

The first meeting of the group was held on May 25, 2006. The Mayor again outlined her goals, TF members introduced themselves, and three volunteers offered to meet separately to develop recommendations for a mission statement, goal, work plan and timeline. That group presented its recommendations on June 8, and the TF agreed on the following:

Mission: To recommend an achievable and measurable set of policies and actions to meet or beat the Governor’s greenhouse gas emission-cutting goals (2000 levels by 2010, 1990 levels by 2020, and 80 percent below 1990 levels by 2050).

Goal: To achieve significant, measurable reductions of greenhouse gas (GHG) emissions in the Palo Alto/Stanford area through positive actions in all sectors of the population”

These goals are different than the goals of the U. S. Mayors’ Climate Protection Agreement, which aims to achieve the Kyoto Protocol goals of reducing greenhouse gas emissions to 7% below 1990 levels by 2012. The TF adapted the Governor’s greenhouse gas emissions-cutting goals because we live in the context of the state and will be held accountable to these goals, not the U.S. Mayors’ goals. Also the Governors goals are longer lasting and are a better match to what the scientific community now believes are required to stabilize our climate.

Work Plan and Timeline

1. Divide into the following committees: Baseline (to determine the starting point for emissions, and means for measuring progress), Energy, Transportation, Buildings, Waste Reduction, and Education. (The Education Committee later changed its title to Education/Motivation, and the Waste Reduction Committee disbanded, based on the conclusion that the best way to reduce emissions from waste is to reduce waste itself, which is being handled by the City’s Zero Waste efforts.)
2. Meet biweekly, with the goal of reporting to the Council by the end of the year.

At the same meeting, Mayor Kleinberg asked the undersigned to chair the TF, with expert assistance—as a volunteer—from Karl Knapp of Utilities, whose work responsibilities include completing the Climate Action Registry greenhouse gas inventory process and developing a climate action plan for the utilities department, and is Palo Alto resident.

The TF followed its work plan (with some committees occasionally holding supplemental meetings between TF meetings), and the committees presented the first draft of their final recommendations to the TF on November 8. The TF expanded along the way, as community members passionate about the issue asked to join the TF, and the Chair decided to welcome them. Attachment 1 contains a list of final membership of the TF.

The Palo Alto Unified School District (PAUSD) generously allowed the TF to hold most meetings in the District's Boardroom, which was large enough for the whole TF to meet and then split into different areas for committee meetings. On days when the Boardroom was busy, the City allowed the TF to meet in the same manner in the Council Chambers. Communication among the TF was greatly enhanced by David Coale of Acterra, who established PAGRTF@yahoo.com, and much of the TF's work can be reviewed on <http://groups.yahoo.com/group/PA-GRTF/files>.

In a summer meeting, Steve Bishop, of the local product design firm IDEO, attended a meeting, explained that his firm had trained facilitators to help them progress from creative brainstorming to decisions on action, and offered to perform the same function for the TF. The TF accepted, and representatives of IDEO hosted and facilitated the September 14 meeting, giving the committees valuable assistance in moving toward concrete recommendations. In a similar vein, the Building Committee accepted the generous offer of Chris Bui, of 5th Medium Interactive Communications, to use his Option Finder technology to help them prioritize their recommendations.

CORE RECOMMENDATIONS

The core theme embodied in the attached reports can be summarized in the recommendation that Council direct staff to evaluate and recommend alternatives that are feasible, effective, and affordable to come as close as practicable to climate neutrality in City government operations; facilitate community-wide activities to reduce emissions; and influence regional, state, and federal agencies to address climate change.

1. Lead by example by continuing to report greenhouse gas emissions inventory for City operations and encourage/challenge businesses to participate.
2. Develop tools to measure progress in achieving community-wide emissions reductions.
3. Develop and implement a climate action plan for the City utilities department with the goal of achieving climate neutrality by 2020.
4. Revise City purchasing policies and practices to incorporate environmental costs.
5. Incorporate City vehicle fleet and employee commuting in the City's climate action plan.

6. Work with regional transportation agencies to advance the availability and ridership of public transportation and low-emissions transportation alternatives.
7. Incorporate green building practices into construction review process and building codes to evolve green building from exception to mainstream.
8. Investigate a public-private partnership with the mission to actively raise awareness of and motivate actions to avert global warming.

EXECUTIVE SUMMARY of COMMITTEE REPORTS

The work of the TF was performed by its committees. Accordingly, this summary will present only the barest highlights of their work, leaving it to each committee to present their own summaries. The attachments containing the Final Reports of the TF committees, and the persons presenting summaries thereof at the study session, are as follows:

Baseline: Attachment 2 (Karl Knapp)

Energy: Attachment 3 (Karl Knapp)

Transportation: Attachment 4 (Bret Anderson)

Built Environment: Attachment 5 (Elke MacGregor)

Education/Motivation: Attachment 6 (Heather Trossman)

There is a certain degree of overlap or duplication in many of the recommendations, as the arena addressed by each committee has some overlap with at least one other committee: building design impacts energy use, transportation is affected by urban planning, and education is a key element to all areas. Highlights of the committees' findings and recommendations are as follows:

Baseline

This committee did an excellent job of researching the emissions generated in the City by transportation and gas and electric consumption. Highlights of their findings are the following:

- Total estimated annual CO₂ emissions from electricity, natural gas, and transportation fuels for Palo Alto are 644,000 metric tons. Per capita emissions are 11.3 tons (CA average is 11.0). These figures do not include rail and marine transport, off-road vehicles, and emissions from landfill, cement, propane or land use impacts.
- More than half of emissions are from transport, with slightly less than half from electricity and natural gas consumption.
- Ninety percent of commute emissions are generated by people traveling alone in a car.
- Combined emissions from electricity and natural gas in 2005 were already 20 percent below those in 1990, meaning that in this area the City has already surpassed the first two of the three goals proposed by the TF. However, although

some of the reductions are due to energy efficiency and renewable energy purchases, they are partly explained by the turndown in the economy.

TF member Jane Melia, from HP, developed a “What If” model for personal transport, which immediately calculates the reductions that could be achieved by various actions, as shown by the following examples:

- (1) Increasing the number of people who carpool to work by 10 percent would reduce CO₂ emissions by six percent (5,500 metric tons).
- (2) If 10 percent of people moved to moderately more efficient cars and 10 percent moved to significantly more efficient cars, CO₂ emissions for commute would decline by 18 percent (18,200 metric tons).
- (3) Allowing 10 percent of the population to work from home one day a week would reduce emissions by two percent at low cost!

Energy

- The total CO₂ emissions generated by energy consumption in 2005 were 310,000 metric tons, 165,000 from gas and 145,000 from electricity.
- Stanford facilities that are served by CPAU are included in these totals, such as Stanford Hospital. However, Stanford University is working to develop their own inventory separately, which is a bit more complicated as they are served by an onsite cogeneration system, PG&E, and some facilities such as SLAC are also federal power customers.
- CO₂ emissions from electrical generation purchased by CPAU are already projected to drop by 50 percent over the next five years based on existing contracts and plans. However, conservation would reduce emissions at a much faster rate than purchase of renewables, because it reduces use of a marginal generation resource, on average a natural gas plant. For example, if the City reduced its electric load by 20 percent from the current 2015 projection, net CO₂ emissions from electricity use, factoring in utility department purchases and sales on the market, would drop by 100 percent. Residential customers constitute over 90 percent of accounts, but less than 20 percent of electricity use. However, they constitute 50 percent of use of natural gas.
- The committee recommended its own overall goal to achieve “climate neutrality” (achieving zero net emissions—or damn close, to adopt the phrasing of Zero Waste) in the City-provided utilities by 2020, through a combination of emission reductions and purchasing offsets to those not reduced. Offsets are expenditures to reduce emissions in other locations, e.g., schools, developing countries, etc. (See www.climateneutral.com.) To accomplish this, it recommended that the Council direct staff to develop a Climate Action Plan for utilities, including the following elements:
 - (1) Reduce electricity and natural gas use through conservation and energy efficiency.

- (2) Reduce the carbon intensity of the energy supply provided by CPAU.
- (3) Expand the use of renewable energy installed or purchased directly by customers.
- (4) Participate in and promote GHG emissions inventory tracking and reporting.
- (5) Promote and implement climate-neutral alternatives and education.
- (6) Employ urban forest opportunities to reduce energy use and increase carbon sequestration.
- (7) Invest in GHG-reducing projects or offsets to balance remaining emissions.
- (8) Support research and development in GHG-reducing science and technology.
- (9) Coordinate climate protection activities with those of building and planning.

The Committee also developed over 65 suggested ideas and strategies to accomplish the foregoing goals, which they whittled down to 43, listed in Appendix “A” of their report. They further prioritized those in terms of Impact, Ease, Time to Implement, and Visibility, with results shown in Table 1 of the report.

The key recommendation pertinent to Stanford University involves a potential approach by which the University and the City may be able to collaborate or otherwise foster synergies to address global warming through tangible local actions, rather than prescriptions for specific tactics. The subcommittee recommends looking into promoting R&D in the “clean-tech” arena, by working to establish a Green Tech Center to facilitate the commercialization of new technologies relevant to global warming.

Transportation

The findings of this committee overlapped some of those by the Baseline Committee (e.g., 50 percent of emissions in the City come from transportation). Its recommendations were as follows:

- Promote alternative fuels, with the City leading the way in purchasing fuel-efficient vehicles.
- Facilitate increased biking and walking.
- Increase mass transit availability.
- Encourage electronic alternatives to travel.
- Reduce emissions from school commuting.
- Use parking incentives to encourage less driving.
- Consider having the City offset its emissions, and encourage businesses and residents to do the same.

Built Environment

This committee divided its recommendations into four categories: New Buildings and Renovations, Energy Efficiency, Landscape, and Pedestrian and Transit Planning. The detailed recommendations are contained in their report. However, the general approaches under the categories were as follows:

- New Buildings and Renovations: A combination of education and financial incentives.
- Energy Efficiency: Provide incentives to encourage businesses and residents to invest in efficiency and renewables; and explore requiring energy upgrades (e.g., installation of solar hot water) when a property changes hands or undergoes significant improvement.
- Landscape: Use trees to save energy, and encourage or require water efficiency and aquifer replenishment.
- Pedestrian and Transit Planning: Encourage transit-oriented density and promote biking and walking.

Education/Motivation

This committee found that like most communities, Palo Alto has many “nodes” of interaction, i.e., segments of the community with which people identify and interact regularly, and the committee recommended using these nodes for effective communication. The identified nodes are the business community, the school community, faith communities, neighborhood organizations, service clubs and community organizations, and City government.

With that finding in mind, the Committee adopted the following mission:

- (1) Improve communication about “green” issues between nodes.
- (2) Identify common goals and reinforce them. Encourage synergy by sharing existing ideas and programs.
- (3) Create a “bandwagon effect” by making the message about our community’s response to global warming constantly reinforced and visible everywhere . Create a sense of moral imperative about this issue.

The Goals the committee adopted to achieve its mission are contained in its report. It also adopted three basic recommendations, with specific suggestions under each:

- (1) Create synergy, not duplication, between new and existing green activities. Suggestions include identifying a lead organization within each node, asking that organization what is already being done in its area, creating a computer database of those actions, and encouraging each node to adopt its own “green certification” program.

- (2) Create an overall “PR Umbrella” for Palo Alto green action. The report contains several creative suggestions for implementation.
- (3) To leverage the work that’s already going on and integrate it with new green action, create a public/private partnership.

The previous bullet may be the most important recommendation of the TF, because it is the one that deals most directly with the issue of how, in the words of Mayor Kleinberg’s charge to the TF, to engage “stakeholders” other than the City government in ongoing activities. (Emphasis added by TF Chair.)

As a model of what they contemplate, the Committee listed the Family Resource Center, which in partnership with the City acts as a “portal” to family services for the community. They recommend that the City assign a part-time staff person to perform a similar function in assisting the various nodes to implement the actions proposed by the TF, and provide a suggested list of specific tasks for that person. Finally it suggests considering Acterra as a possible partner, because it is already in the process of designing a program to encourage residents, on a door-to-door basis, to take specific actions toward reducing emissions.

CONCLUSION

The community volunteers of the TF have done a remarkable job of fulfilling the task assigned to it by Mayor Kleinberg—“to recommend tangible steps and local actions by all stakeholder groups, including the City, to reduce global warming and encourage sustainable practices.” They did not have the assistance of a formal staff. *However, they could not have completed their task without major support from Karl Knapp, who spent many hours on the project operating on his own time, in addition to his regular duties with CPAU.*

The fundamental question now is, “What will be done to implement the TF’s recommendations?” Without specific action on that front, they will simply gather dust—a result that would constitute betrayal of an enormous community effort.

This report offers two recommendations to ensure such implementation; namely,

- Direct staff to develop a formal Climate Action Plan (see report of Energy Committee). This approach is similar to the one adopted on the issue of Zero Waste, in which a citizens’ committee proposed a Strategic Plan (analogous to this report), which the staff is using to develop an Operations Plan (analogous to the requested Climate Action Plan).
- As part of the Action Plan, devise a Public/Private Partnership along the lines recommended by the Education/Motivation Committee. The TF believes that the formation of such a partnership is absolutely essential if the City is serious about engaging all stakeholders (“nodes”) of the community.

Since the public has begun to take climate change more seriously, new ideas for action are constantly emerging. The Chair therefore also recommends that the Council direct

that the duties of the Partnership include convening periodic meetings in which TF members and the public would be invited to suggest other possible actions to be taken by the City and its stakeholders. The suggestions would then be forwarded to City staff, who would decide whether to recommend that they be adopted by the Council.

The Task Force understands that the City faces daunting budget challenges. As explained above under “The Challenge,” however, climate change is arguably the biggest threat facing the planet today. If the Council accepts that fact, it can certainly find a way to fund implementation, either by developing new revenue sources or cutting other services.

The members of the Task Force thank the Mayor for her leadership in initiating this process, and urge the Council to take all necessary steps to bring it to fruition.

Walt Hays, Chair

Palo Alto/Stanford Green Ribbon Task Force on Climate Protection

Bret Andersen	Palo Alto Council of PTAs
Penny Barrett	Palo Alto Ministerial Association, First Church of Christ Scientist
Allan Berkowitz	Executive Director, Environmental Volunteers
Steven Bishop	Design for Sustainability, IDEO
Jim Burch	Trustee, Foundation for a Global Community Former Mayor, Palo Alto
Chris Bui	Social Entrepreneur & Omniactive Facilitator, 5th Medium Interactive Communications
Melissa Caswell	President, Palo Alto Council of PTAs
Jeremy Carl	Ph.D. Candidate, Interdisciplinary Program in Environment and Resources, Stanford University
Tony Carrasco	Architect, Carrasco & Associates
Chris Christofferson	Associate Vice Provost for Facilities, Stanford University
Michael Closson	Executive Director, Acterra
David Coale	Global Warming Policy Chair, Sierra Club Loma Prieta Chapter
Sarah Connick	Associate Director, Sustainable Conservation
Cedric de La Beaujardière	Vice Chair, Palo Alto Bicycle Advisory Committee
Dave Dockter	Managing Arborist, City of Palo Alto Planning and Community Environment Department
Peter Drekmeier	Executive Director, Earth Day Network; Palo Alto City Council Member
Kirsten A. Flynn	Sustainable Home
Amy French	Planning Manager, City of Palo Alto Planning and Community Environment Department
Walt Hays	Sustainable Schools Committee
Carroll Harrington	Harrington Designs; Palo Alto Chamber of Commerce; American Association of University Women
Bruce Hodge	Computer Scientist
Jeffrey Hook	Ecologist specializing in Energy and Overpopulation Volunteer with Magic, Inc.
Jim Inglis	Manager of Design & Construction, Stanford Management Company
Leigh Johnson	Associate Director of Programs, Woods Institute for the Environment, Stanford University
Thomas Jordan, Jr.	Attorney at Law, Environmental Law; Palo Alto Neighborhoods Association
James Kao	CEO, Green Citizen, Inc.
Arthur Keller	Planning & Transportation Commissioner

Attachment 1: Task Force Roster

Judy Kleinberg	Mayor, City of Palo Alto
Karl Knapp	Senior Resource Planner, City of Palo Alto Utilities Department
Christine Kohl-Zaugg	Environmental & Occupational Risk Management, Inc.
Jeffrey Koseff	Director, Woods Institute for the Environment, Stanford University
Sandra Lonnquist	CEO, Palo Alto Chamber of Commerce
Elke MacGregor	DES Architects Engineers
Drew Maran	Drew Maran Construction/Design
Catherine Martineau	Executive Director, Canopy
Jerry Matranga	Associate Superintendent, Palo Alto Unified School District
Jean McCown	Director of Community Relations, Stanford University
Jane Melia	Strategic Planning and Modeling (SPaM), Hewlett Packard
Ted Mendoza	Salas O'Brien Engineers (PAUSD consultants)
Debbie Mytels	Associate Director for Programs, Acterra: Action for a Sustainable Earth
Pete Pearne	Manager, Maintenance, Operations, Construction; PAUSD
Larry Perlin	Management Specialist, City of Palo Alto Planning and Community Environment Department
Russ Reich	Planner, City of Palo Alto Planning and Community Environment Department
Michael Miller	Director, Environment Sector, Electric Power Research Institute (EPRI)
Armand Neukermans	BSEI Institute
Roy Nordblom III	Green Building Consultant
Robert Parkhurst	Global Environmental Program Manager, Hewlett-Packard
Steve Raney	Cities21
Susan Rosenberg	Chair, Canopy
Mark Sabin	Director, Palo Alto Chamber of Commerce
Linda Schuck	Woods Institute for the Environment, Stanford University
Jonathan Stoumen	Architect, LEED AP
Marshall S. Smith	Education Program Director, The William and Flora Hewlett Foundation
John Tarlton	President & CEO, Tarlton Properties
Melinda Teves	Resident & Schoolteacher
Sally Tomlinson	Executive Director, Sustainable Silicon Valley
Heather Trossman	Heather Trossman Architecture & Planning
Karl Van Orsdol	Energy Risk Manager, City of Palo Alto Administrative Services Department

Baseline Committee Key findings

12/18/2006

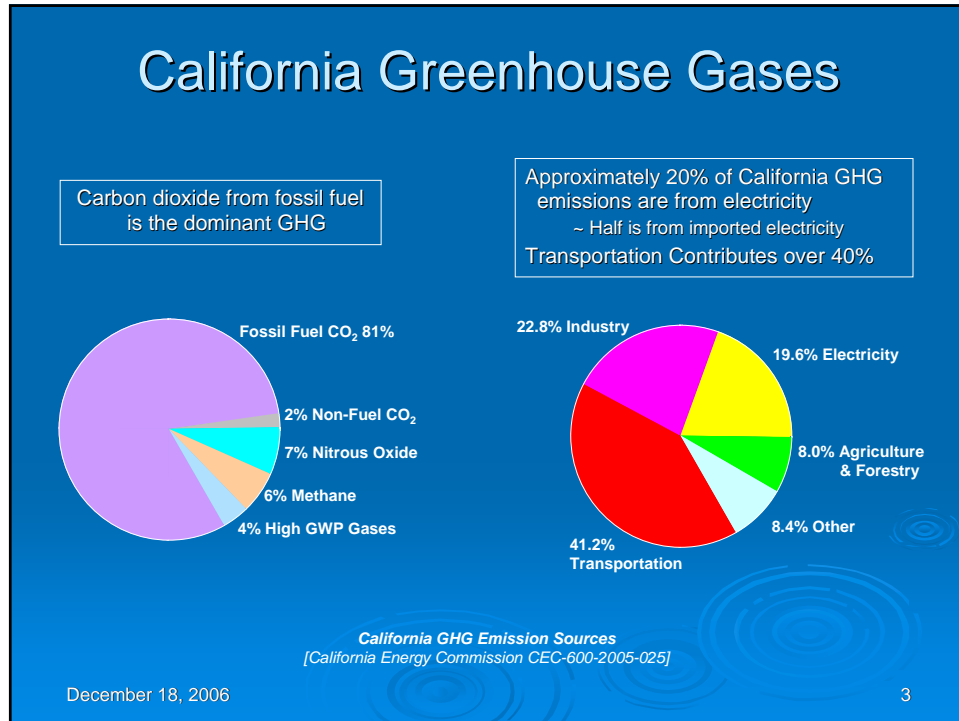
Jane Melia, Bruce Hodge, Karl Knapp, David Coale, John Tarlton
Catherine Martineau, Peter Drekmeier, Leigh Johnson, Linda Schuck

Contents

- Greenhouse Gas Emission Sources in California
- CO₂ emissions by source – Palo Alto
- Focus on transportation
 - Transportation emissions by travel mode
 - Transportation emissions by usage
 - Passenger car impacts
 - Transport what-if model: screen-shot and sample results
- Utilities energy use
 - Electricity and natural gas usage and CO₂ history
 - Breakdown by customer class
 - Allocation by end use

December 18, 2006

2

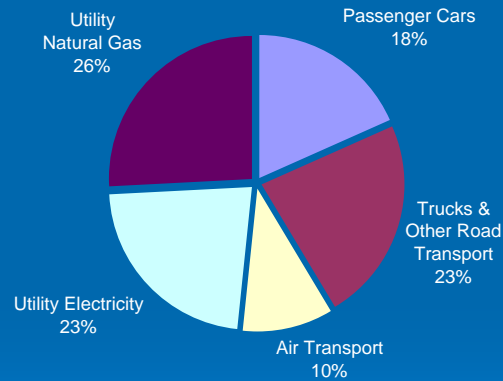


CO₂ estimates are imperfect, but are reasonably representative

- The GRTF Baseline committee collected data to estimate and understand the base levels of CO₂ emissions in or attributed to Palo Alto due primarily to transportation and utilities energy use.
- The committee had to reference a number of different sources to estimate this baseline, and the values obtained differed to some extent between sources.
- However, the committee team is confident that the estimates obtained are reasonably representative of both the relative and absolute sizing of the different sources of the emissions.

December 18, 20064

Palo Alto CO₂ Emissions by Source



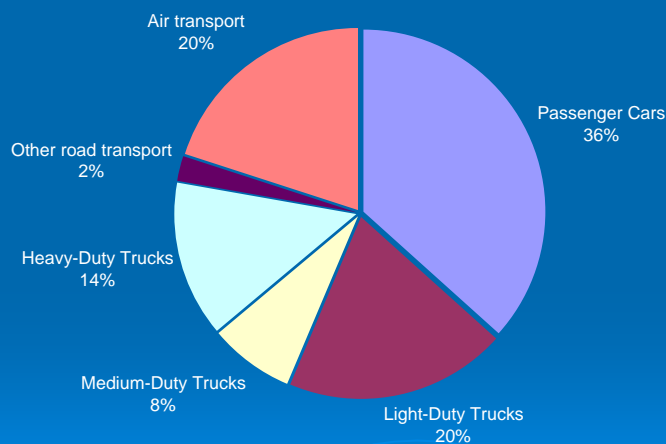
- A little less than half of emissions are from electricity and natural gas (which are almost equal)
- More than half of the emissions are from transport
- Trucks and other vehicles are the biggest portion of road transport emissions
- No one source dominates

- Total CO₂ emissions for Palo Alto are 644,000 metric tons
- Per capita emissions are 11.3 metric tons per person. CA average is 11.0
- Does not include: rail and marine transport, off road vehicles, landfill emissions, CO₂ from cement, propane.

December 18, 2006

(1 metric ton = 1000 kg = 2205 lbs) 5

Transportation CO₂ Emissions by Mode

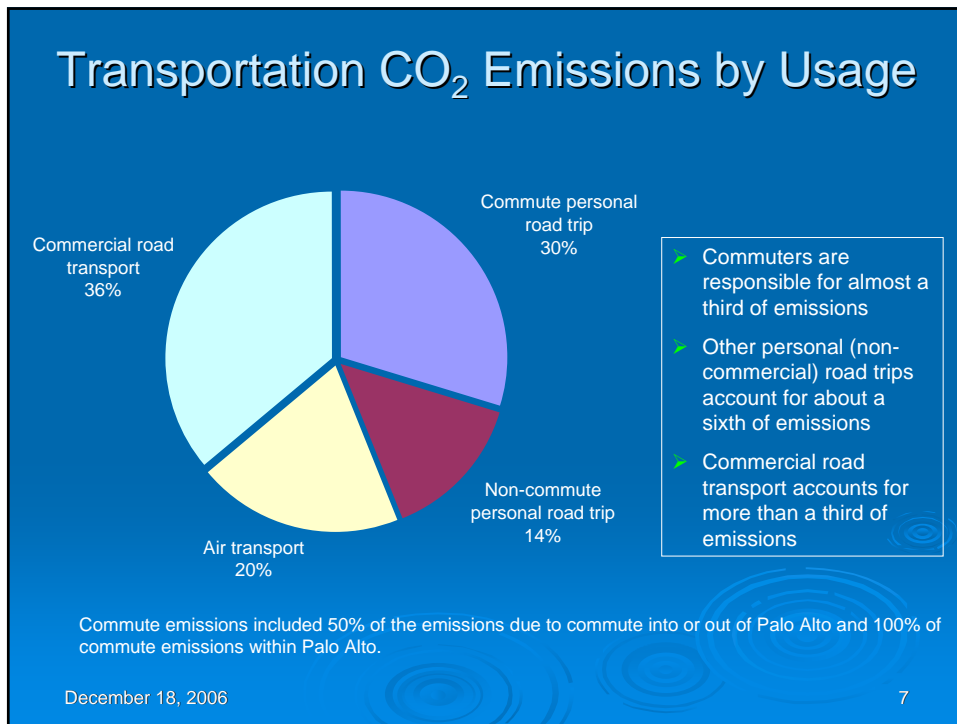


- Truck (includes vans & SUVs) transport emissions dominate the mix (42%)
- Passenger car emissions contribute more than a third
- Air transport is more than half of passenger car emissions

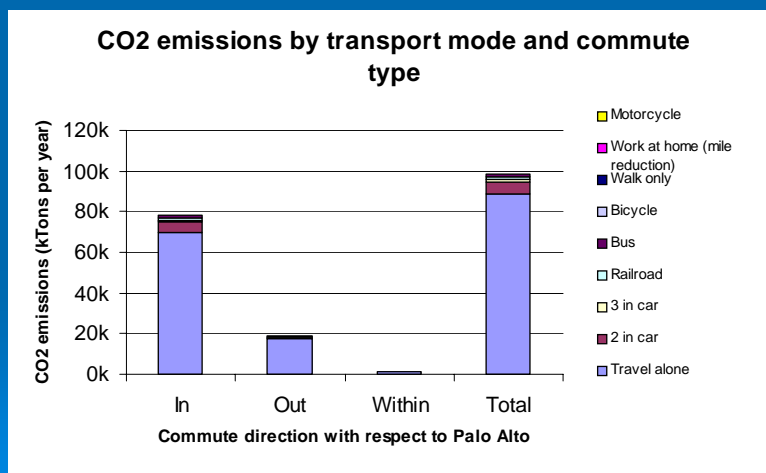
Transportation emissions are based on fuel consumption extrapolated from regional data.

December 18, 2006

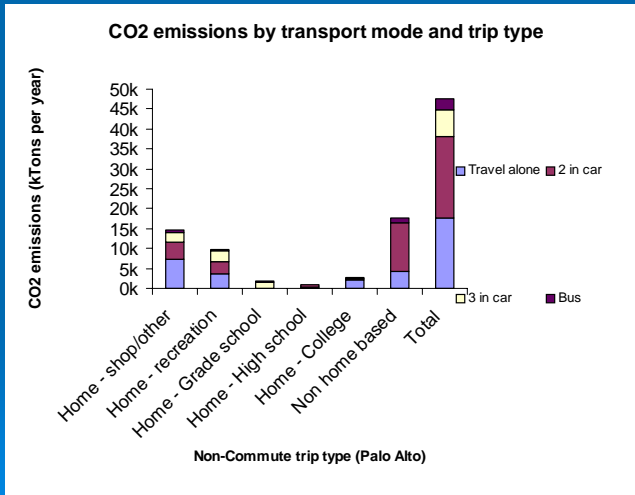
6



90% of commute CO₂ emissions are generated by people traveling alone in a car



95% of non-commute personal transport emissions are due to cars

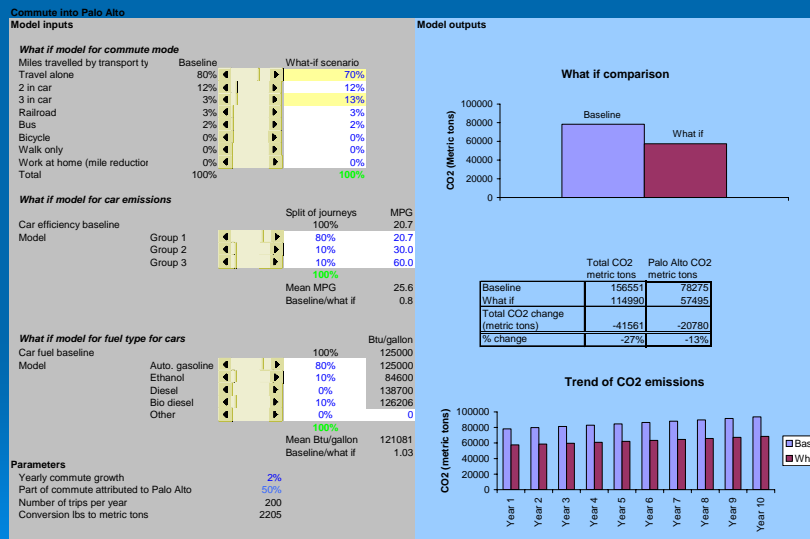


December 18, 2006

9

What if model for passenger transport (screen shot).

Can be used to test and rank the impact of different ideas for reducing CO2.



December 18, 2006

10

What if model – sample results

- Increasing the number of people who carpool to work by 10% would reduce CO₂ emissions for commute by 6% (5,500 metric tons).
- If 10% of people moved to moderately more efficient cars and 10% move to significantly more efficient cars, then CO₂ emissions for commute would decline by 18% (18,200 metric tons).
- Allowing 10% of the population to work from home 1 day a week would reduce emissions by 2% at low cost!

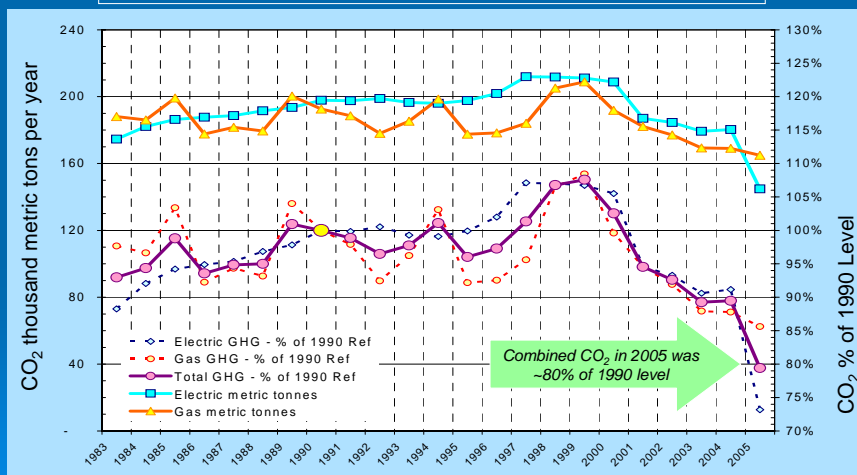
December 18, 2006

11

Palo Alto Electric and Natural Gas CO₂ Estimates

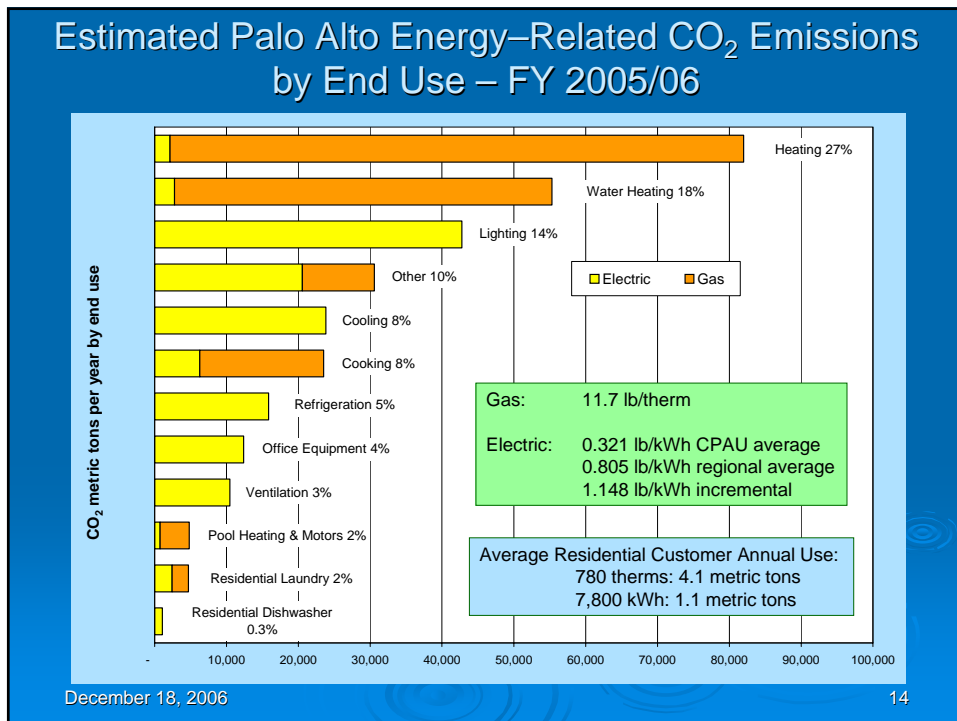
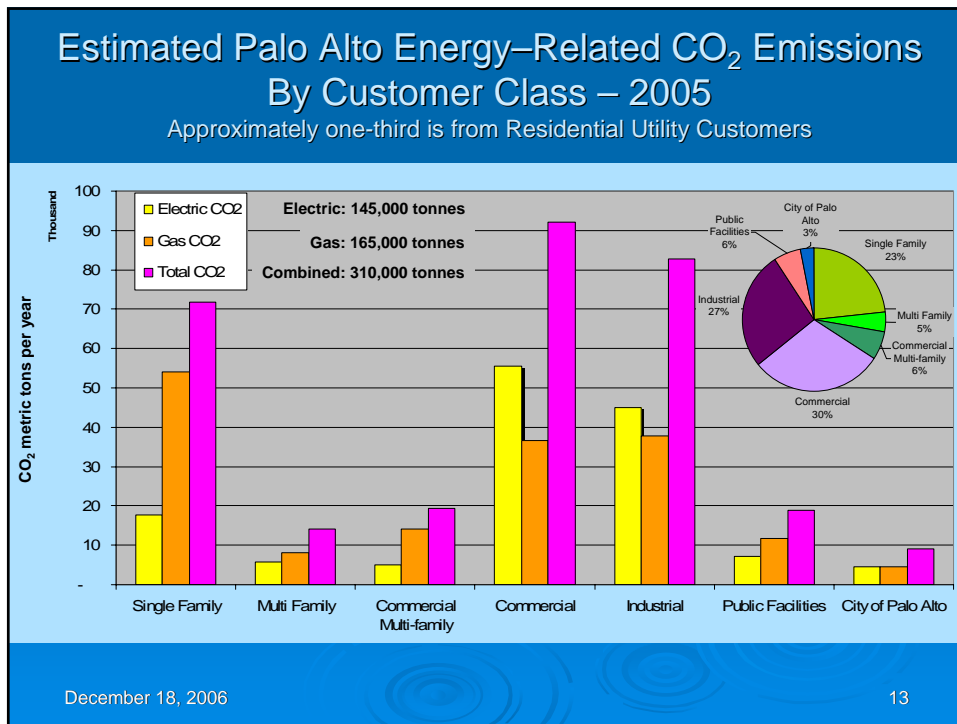
Estimated City-wide CO₂ emissions in thousand metric tons per year

	1985	1990	1995	2000	2005
Electricity:	187	198	198	209	145
Natural Gas:	199	193	178	192	165
Combined:	386	391	376	401	310



December 18, 2006

12



Baseline Committee Observations and Recommendations

- There is no uniformly accepted baseline methodology for municipalities.
- Electricity and gas usage is straightforward, but city-wide CO₂ emissions from transportation are very difficult to estimate.
 - The approach used provides reasonable estimates for transportation and is useful for estimating potential impacts of changes, but does not provide a reliable measure of progress from year to year.
 - Would be improved with more frequently updated Palo Alto specific data.
- The committee did not address non-fossil fuel CO₂ or other greenhouse gases such as methane, nitrous oxide, refrigerants, or sulfur hexafluoride.
- In developing targets, devise a method to measure and track progress.
 - Applies to government, corporations, or even individuals.
 - Reporting protocols are being developed by agencies such as ICLEI and the California Climate Action Registry
 - Measure progress against time, not against others.

December 18, 2006

15

Data sources

- Commute data: Palo Alto census 2000
- Non commute personal travel: Bay Area Metropolitan Transport Commission (MTC) data for Bay Area Region 2000, extrapolated based on population.
- Overall road travel: fuel data from California Air Resources Board (CARB) and Board of Equalization (BOE) for road transport at a state, region and county level (2005)
- Road travel transport classes: CARB, MTC
- Air transport emissions: California Energy Commission
- Utilities – gas and electricity : Palo Alto Utilities 2005, Climate Action Registry, Rocky Mountain Institute

December 18, 2006

16

Palo Alto Estimated Emissions Baseline Summary

Source	Range of data (tonnes per year)		% of total
Road Transport	266,500	315,800	41%
Passenger Cars	118,638	140,600	18%
Not Passenger Cars	147,900	175,200	23%
Air Transport	66,900	NA	10%
Utility Electricity	145,000	NA	23%
Utility Natural Gas	165,000	NA	26%
Total Palo Alto	643,400	692,700	100%

Data: Vehicle definitions and emissions split

Vehicle Type	Emissions %
Passenger Cars	37%
Light-Duty Trucks 1 (<3,750 lbs)	9%
Light-Duty Trucks 2 (3,751-5,750 lbs)	11%
Medium-Duty Trucks (5,751-8,500 lbs)	8%
Light Heavy-Duty Trucks 1 (8,501-10,000 lbs)	2%
Light Heavy-Duty Trucks 2 (10,001-14,000 lbs)	1%
Medium Heavy-Duty Trucks (14,001-33,000 lbs)	3%
Heavy Heavy-Duty Trucks (>33,000lbs)	8%
Urban Buses	2%
Motorcycles	0%
Motor Homes	0%
School Buses	0%
Air	20%

December 18, 2006

18

Palo Alto-Stanford Mayor's Green Ribbon Task Force Energy Subcommittee Report

The Energy Subcommittee recommends that

1. Community businesses, institutions and residents take individual and collective action to reduce their environmental footprint, aided, we hope, by some of the ideas and suggestions presented in this report; and
2. Council direct or authorize staff to develop a climate action plan for the City utilities department with the goal of achieving climate neutrality by 2020; and
3. City Council, Committees, Commissions, Boards, and City staff take these suggestions into account as they develop, review and implement initiatives and programs, and adopt new codes, standards and procedures applicable to energy-related greenhouse gas emissions.

Respectfully Submitted by

David Coale
Karl Knapp
James L. Kozelka
Catherine Martineau
Linda Schuck
Sally Tomlinson

Special thanks to:

Chris Christofferson
Susan Kulakowski
Bruce Hodge
Jane Melia
Karl Van Orsdol
John Tarlton
Leigh Johnson
Jeremy Carl
Walt Hays

Executive Summary

The Energy Subcommittee focused on electricity and natural gas consumption, which comprises approximately half of the estimated carbon dioxide emissions from Palo Alto government, residents and businesses served by the City's Utilities Department, the other half attributable to transportation. Many of the recommendations contained in this report could apply to both Palo Alto and to Stanford University and its environs, but most are specific to actions that the Utilities Department (CPAU), other City government, or the community at large can take to help to support the GRTF goals of reducing greenhouse gas emissions. The key recommendations pertinent to Stanford center around ways in which the University and the City may be able to collaborate or otherwise foster synergies to address global warming through tangible local actions, rather than prescriptions for specific tactics.

Estimated CO₂ emissions from electricity and natural gas in 2005 were already 20% below 1990 levels, due to 14% lower natural gas consumption and 9% lower electric consumption, which combined with the increase in electric supply from new renewable energy supply contracts has reduced CO₂ emissions from electricity use by about 25%. The reduced usage is partly due to investments in energy efficiency, structural changes in the kinds of businesses located in Palo Alto, and partly due to reduced economic activity. With both the near-term possibilities of resurgence in energy use from economic rebound, and the long-term vision of reducing greenhouse gas emissions by 80% by 2050, the Energy subcommittee developed the following Goal Statement:

Reduce greenhouse gas emissions from electricity and natural gas usage to achieve climate neutrality by 2020 by doing all of the following:

1. Reduce electricity and natural gas use through conservation and energy efficiency.
2. Reduce carbon intensity of energy supply provided by CPAU.
3. Expand use of renewable energy installed or purchased directly by customers.
4. Participate in and promote greenhouse gas emissions inventory tracking and reporting.
5. Promote and implement climate-neutral alternatives and education.
6. Employ urban forest opportunities to reduce energy use and increase carbon sequestration.
7. Invest in GHG-reducing projects or offsets to balance remaining emissions.
8. Support Research and Development in GHG-reducing science and sociology.
9. Coordinate energy climate activities with building and urban planning activities.

"Climate Neutral" in this context does not necessarily mean zero emissions, but as close to zero as is feasible and practical, similar to the goals of the Zero Waste Strategic Plan.

Electricity and Natural Gas Background

Palo Alto's starting point with respect to greenhouse gas emissions from electricity and natural gas is provided in the Baseline subcommittee report, some of which is repeated in this report for context and clarity.

Historical Usage and Related CO₂ Emissions Estimates

A tremendous advantage of the City operating its own electric and gas utility is that data on electricity and gas usage and supply are available in one place. As illustrated in Figure 1 below, electricity and gas usage peaked around 1999, and in 2005 electricity purchases were 9% and gas purchases 14% lower than in 1990. CO₂ emissions from electricity dropped significantly from 2004 to 2005 even though total usage was essentially identical, due primarily to an increase in new renewable resources in the supply mix, which reduced the average CO₂ emission coefficient from 0.4 lb/kWh to about 0.32 lb/kWh. Estimated CO₂ emissions over time are illustrated below. Total estimated CO₂ emissions from energy served by CPAU in 2005 were 145,000 metric tonnes from electricity and 165,000 metric tonnes from natural gas. Stanford facilities that are served by CPAU are included in these totals, such as Stanford Hospital. However, Stanford University is working to develop their own inventory separately, which is a bit more complicated as they are served by an onsite cogeneration system, PG&E, and some facilities such as SLAC are also federal power customers.

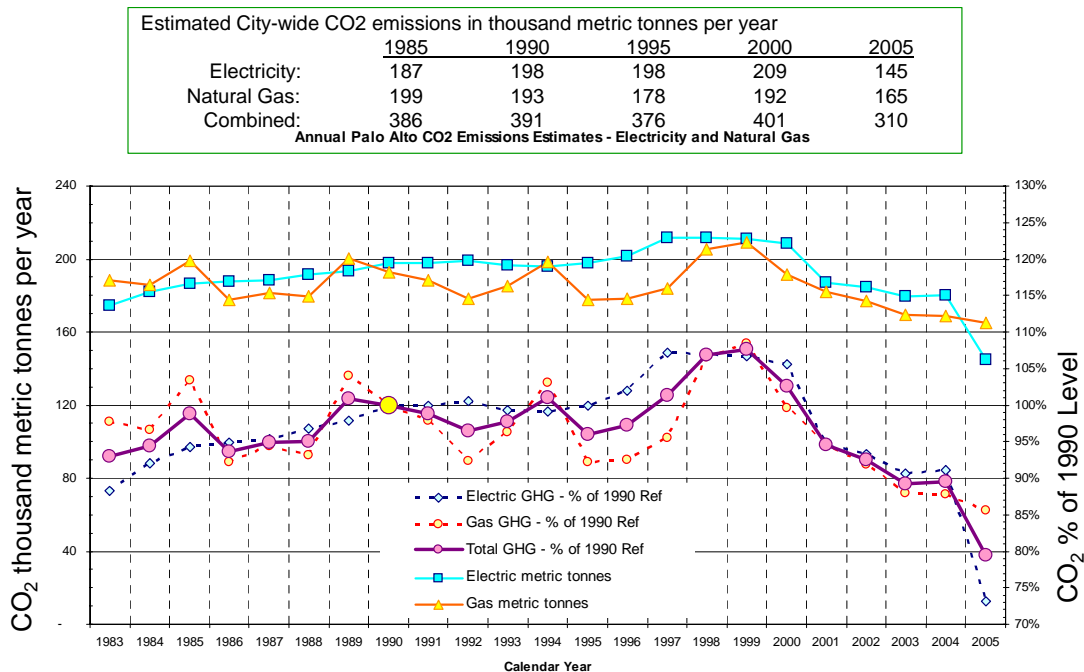


Figure 1. Estimated CO₂ emissions from electricity and natural gas use since 1983 are plotted in the top two curves, and the percent relative to 1990 levels in the bottom three curves. Electric and gas sales peaked around 1999. Emissions in 2005 are estimated to be 20% below 1990 levels. Over the same time period, state-wide emissions from electricity have increased 35% and natural gas emissions decreased 1%.

Customer Type and Energy End Use Breakdown

The composition of CPAU's electric and natural gas customers, as well as the end uses for both forms of energy helps to provide some insight into the opportunities for greatest potential impact. Best estimates of the breakdowns by customer class and end use are illustrated in the following three charts (Figures 2,3,4), based on retail sales data, California Climate Action Registry inventory data, and research conducted for CPAU by the Rocky Mountain Institute in 2005. Several end uses may appear small, but can be easy to reduce or provide indirect value such as education.

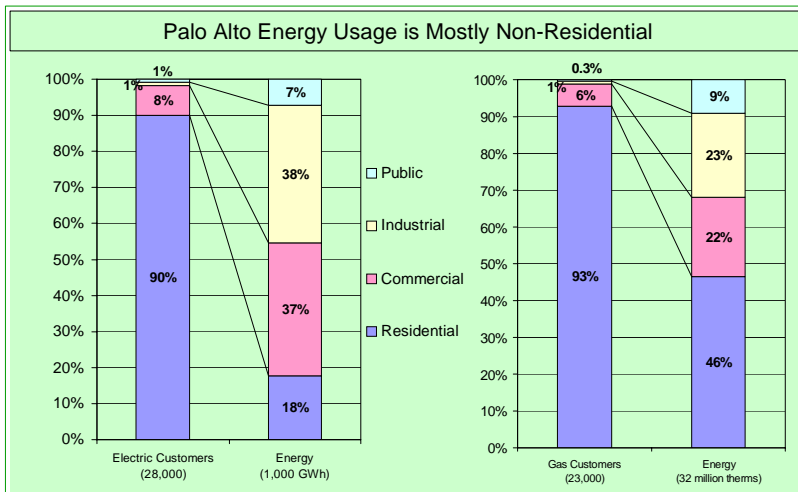


Figure 2. Residential customers comprise over 90% of accounts, but less than 20% of electricity use and nearly 50% of natural gas use. Based on CPAU retail sales fiscal year 2005-2006.

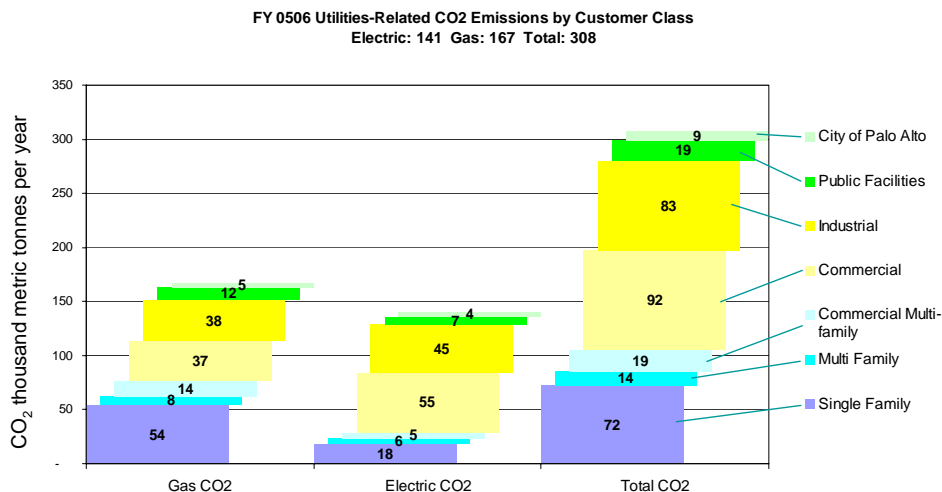


Figure 3. Allocation of average CO₂ emissions by CPAU electric and natural gas customer classes. Based on CPAU retail sales fiscal year 2005-2006. Residents comprise approximately 34% of the total. City municipal government operations are about 3%. Potential for emission reductions from electric efficiency and conservation are approximately three times the average value.

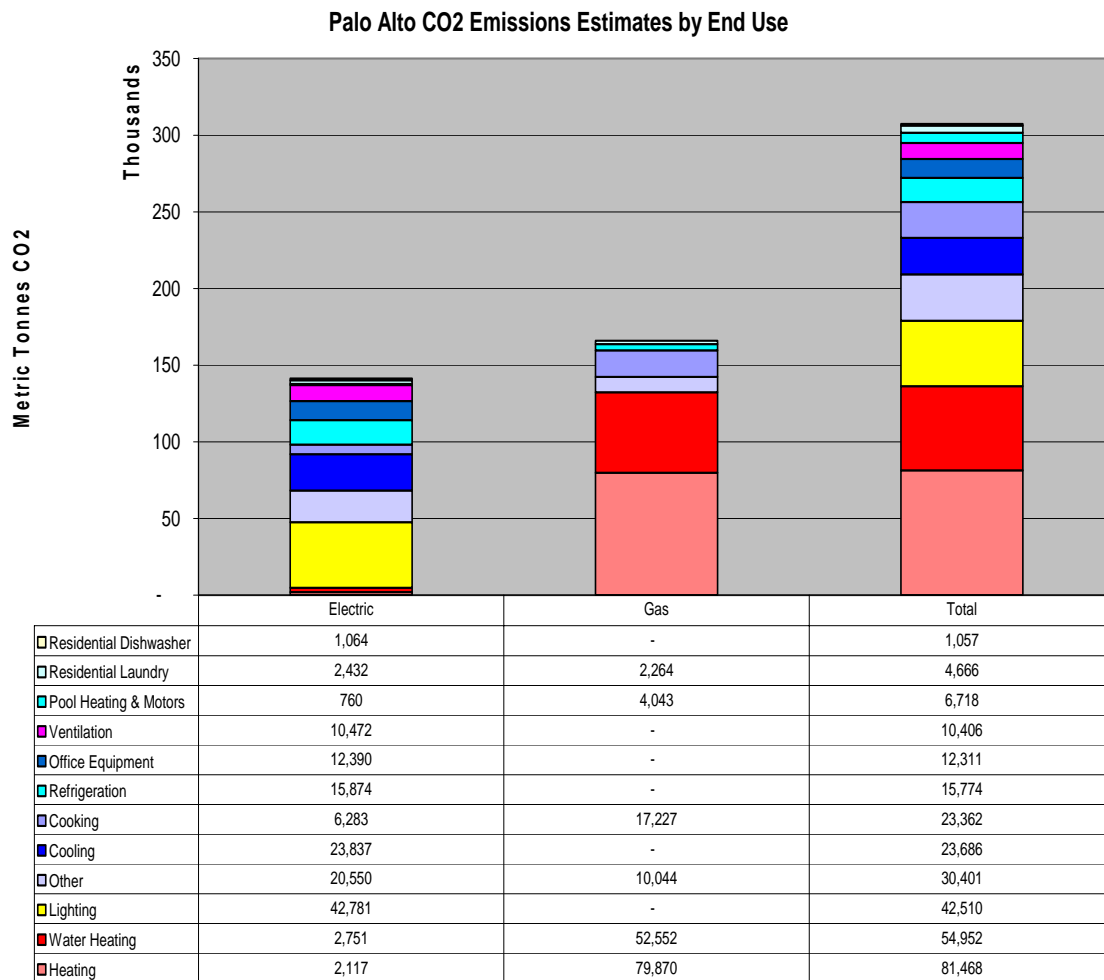


Figure 4. Allocation of average CO₂ emissions by electric and natural gas end uses by CPAU customers. Based on Rocky Mountain Institute study of energy efficiency potential in Palo Alto, December 2005 and retail sales data for FY05/06. Space heating, water heating, and lighting make up nearly 60% of the total. Cooling is the second highest electric end use, dominantly from commercial buildings. Potential for emission reductions from electric efficiency and conservation are approximately three times the average value.

Current Power Supply Mix and Projections

CPAU's electric power supply in 2005 consisted of 54% specific purchases from large hydroelectric facilities from Western and Calaveras, 6% eligible renewable resources from wind and small hydroelectric facilities, 3% from wind and solar renewable energy credits for Palo Alto Green, and the remainder from the "generic" power market. All of the coal, natural gas, and nuclear power supply, as well as some additional renewable and large hydroelectric supply in Palo Alto's Power Content Label (shown in Figure 5 below) is due to the default fuel composition of California's Net System Power Mix reported by the California Energy Commission.

POWER CONTENT LABEL				
ENERGY RESOURCES PALO ALTO	PALO ALTO GREEN Usage Based ^(a) (projected)	PALO ALTO GREEN Blocks ^(b) (projected)	CPAU POWER ^(c) (projected)	2004 CA POWER MIX ^(d) (for comparison)
Eligible Renewables	100%	15%	8%	4%
-Biomass & Waste	0%	<1%	<1%	<1%
-Geothermal	0%	1%	1%	3%
-Small Hydroelectric	0%	2%	2%	1%
-Solar	3%	<1%	<1%	<1%
-Wind	97%	12%	5%	<1%
Coal	0%	10%	11%	29%
Large Hydroelectric	0%	59%	63%	20%
Natural Gas	0%	16%	17%	45%
Nuclear	0%	1%	1%	2%
Other	0%	0%	0%	0%
TOTAL	100%	100%	100%	100%
<p>(a) 100% of PaloAltoGreen (Usage Based) is specifically purchased from individual suppliers for Residential and Small Commercial customers based on total consumption.</p> <p>(b) 65% of PaloAltoGreen (Blocks) is specifically purchased from individual suppliers for Large Commercial and Institutional customers based on subscriptions for monthly 1000kWh "blocks" that are the same mix as PaloAltoGreen (Usage Based).</p> <p>(c) 60% of CPAU Power is specifically purchased from individual suppliers. CPAU Power is the default power mix for CPAU customers.</p> <p>(d) Percentages are estimated annually by the California Energy Commission based on the electricity sold to California customers during the previous year.</p> <p>Percentages were rounded to the nearest whole percentage so the numbers may surpass 100% when added together.</p> <p>For specific information about this electricity product, contact City of Palo Alto Utilities at (650) 329-2161. For general information about the Power Content Label, contact the California Energy Commission at 1-800-555-7794 or http://www.energy.ca.gov/consumer/power_content_label.html</p>				

FINAL 2505 4/06

Figure 5. Palo Alto Power Content label for calendar year 2005. Including Palo Alto Green, approximately 11% is from eligible renewable resources, and 61% from large hydroelectric power, or 72% non-fossil and non-nuclear.

In 2002, the City adopted its own Renewable Portfolio Standard (RPS) targets to achieve 10% of the annual electric portfolio energy supply from new eligible renewable resources by 2008 and 20% by 2015, which is in addition to the voluntary purchases for Palo Alto Green customers. City Council has approved five contracts that are anticipated to achieve the first goal already this year, and reach 17-20% by 2008. CPAU has adopted a more aggressive stance in its Long-term Electric Acquisition Plan (LEAP) to strive to meet the 2015 goal by 2010. In July of 2006, Council also approved an agreement with the Northern California Power Agency (NCPA) to procure up to an additional 13% in a joint purchase with several other municipal utilities. The solicitation process for this additional supply is underway.

Figure 6 below illustrates the projected long-term basic electricity supply mix given the existing contracts and solicitations underway, with the future ten years out also illustrating the variability in the total power supply that can occur due to weather, as hydroelectric power supply can vary by as much as 20-25% of Palo Alto's total supply. With this in mind, some averaging over drought and flush years may be appropriate for measuring progress toward achieving greenhouse gas targets. The range of 0.15-0.20 lb CO₂/kWh in a normal year stems from the uncertainty in how the remaining deficit might be filled, estimated as the range projected for the California net system power mix.

Potential for emission reductions from electric efficiency and conservation are approximately three times the average value.

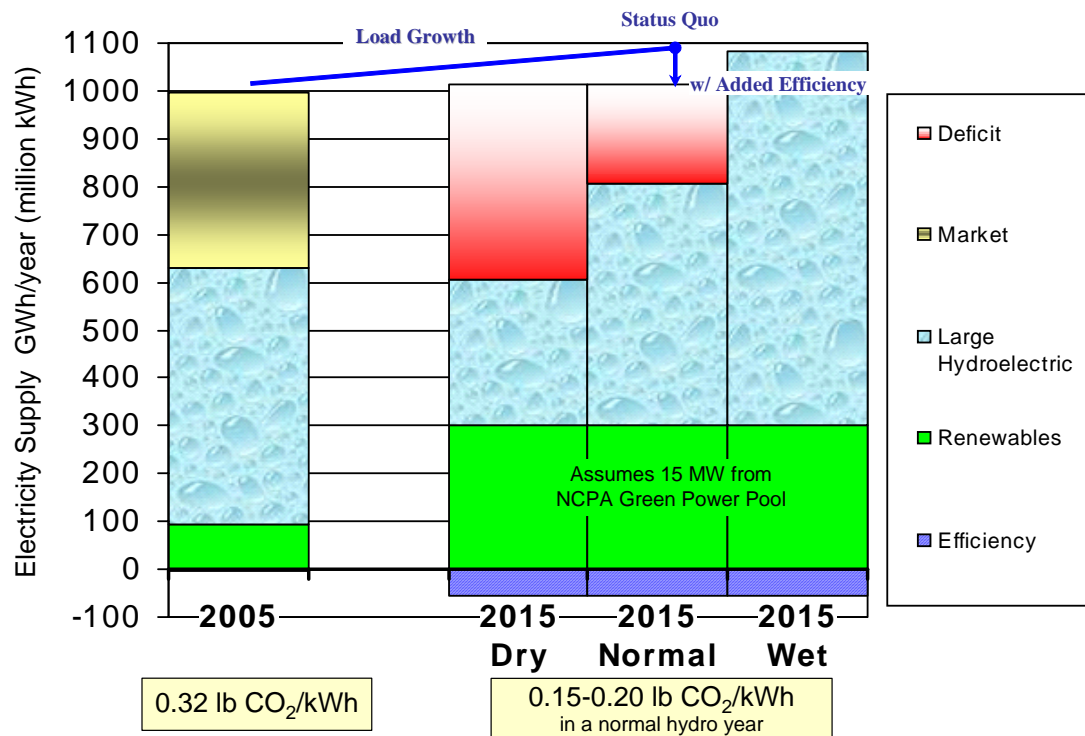


Figure 6. CO₂ emissions from electricity are projected to drop by about 50% based on power purchase agreements and plans that are already in place. CPAU estimates that energy efficiency reductions on the order of 4-5% from otherwise projected annual needs is theoretically possible and economical in the ten-year time frame, which could keep total supply requirements essentially flat. Estimated CO₂ reduction that result from electric efficiency and conservation range from .805 to 1.148 lb/kWh, the emissions associated with the generic market purchases that are avoided.

Electric Energy Efficiency and Conservation

Although Palo Alto's average CO₂ content is currently 0.32 lb/kWh and projected to drop to 0.2 or lower in the next ten years, electric energy efficiency reduces carbon dioxide emission at a much higher "marginal" rate, because the avoided energy is the generic portion of the above resource stack – the renewables and hydroelectric power supplies are constant. Even if Palo Alto purchased 100% of its power from carbon-neutral sources, what physically takes place on the California power grid when a kWh is saved is that the marginal generation resource, on average a natural gas fired power plant, reduces its output. The California Climate Action Team estimates this marginal coefficient to be 1.148 lb/kWh, and the California Climate Action registry uses a USEPA "eGrid" Northern California average coefficient of .805 lb/kWh. For example, if Palo Alto's load were to drop by 20% from the 2015 projection, net annual emissions of CO₂, factoring utility department purchases and sales on the market, would drop by 100%, not 20%. Natural gas does not exhibit this complexity, with a coefficient of 11.64 lb/therm. The average residential customer in Palo Alto uses approximately 7,800 kWh and 780 therms

per year, which translates to an average share of utility-based CO₂ emissions of 5.2 metric tons: 4.1 from natural gas and 1.1 from electricity.

Palo Alto Green

Palo Alto Green (PAG) is a voluntary “green pricing” retail rate program that allows CPAU electric customers to pay a slightly higher rate, by 1.5 ¢/kWh, which CPAU uses to purchase renewable energy supplies and/or renewable energy credits that are additional to the energy being purchased for the renewable energy goals of the city-wide electric supply mix.

Renewable energy purchases only make a difference in greenhouse gas emissions if the facilities would otherwise not have been built. Purchasing Renewable Energy Credits (RECs) or renewable energy supplies achieves that objective by reducing the supply from the pool of available energy available to utilities working to meet their renewable supply requirements, and by creating a financial incentive for new green power plants to be built.

Suggested Strategies and Tactics to Address Greenhouse Gas Emissions

The Energy Subcommittee developed over 65 specific ideas, each with its own purpose (what is it addressing – energy supply, efficiency, offsets, etc), type of action (laws, retail rates, incentives, etc.), and who is responsible (Government, Utilities, Businesses, Residents, Etc.). Because the group was focused on electricity and natural gas, roughly half of the ideas are suggestions that fall squarely in the lap of the Utilities Department. About half of the rest fall into non-utilities City Government, and the rest are generally applicable to the broader community at large. Many of the ideas simply reinforce the importance of activities that may already be underway or on the radar screen.

All of the key ideas that made the “short list” of about 43 are summarized in Appendix A, grouped into twelve major categories (in no particular order). The group worked to further evaluate each idea by Impact, Ease of Implementation, Time Frame to implement, and Visibility/Strategic Impact. After several rounds of ranking and prioritizing, those recommendations and ideas that received the three best scores in at least one of these categories are highlighted in Table 1 below. The rankings are based on an average score from one to ten by the individual committee members.

Urban forest management is also included in the “top twelve” summary table, even though it was not in the top three in any of the four categories, because of the many benefits beyond just the greenhouse gas impacts of trees and the current efforts to revamp the City’s street tree management plan.

The subcommittee also recommends looking into promoting R&D in the “clean-tech” arena, by working to establish a Green Tech Center to facilitate the commercialization of new technologies, described more fully in the appendix. This recommendation falls somewhat outside of the Energy Subcommittee scope, but serves as a fruitful avenue for pursuing collaborative efforts with Stanford University.

The Energy Subcommittee recommends that City staff, Commissions, Boards and Council take these suggestions into account as they develop and implement utilities programs and initiatives and adopt new codes, standards and procedures applicable to energy-related greenhouse gas emissions, and recommend that community businesses, institutions and residents take individual and collective action to reduce their environmental footprint, aided, we hope, by some of the ideas and suggestions above.

Table 1. Energy Subcommittee ideas scoring in top three in each scoring category.

COMBINED 3-way tie for 3rd
1. Community challenge to join Sustainable Silicon Valley and/or CA Climate Action Registry
2. Actively advertise available tax credits and incentives (see CPAU website)
3. LED tree lights for University Ave.
4. Provide PaloAltoGreen-like option to invest in offsets for natural gas use or climate neutral utility bills.
5. Provide incentives for companies to purchase Palo Alto Green – inverse tiered rate structure for PA Green, the more you buy the cheaper it is per unit.
IMPACT
1. Match energy-related GHG emissions with offsets (individuals and companies)
2. Meet all energy load growth with efficiency and renewable resources
3. Sign up for Palo Alto Green – e.g. set goal to sign up 50% of electricity to be PaloAltoGreen
EASE
1. Actively advertise available tax credits and incentives (see CPAU website)
2. Add efficiency checklist as standard in planning and ARB reviews.
3. LED tree lights for University Ave.
TIME
1. LED tree lights for University Ave.
2. Community challenge to join Sustainable Silicon Valley and/or CA Climate Action Registry
3. Actively advertise available tax credits and incentives (see CPAU website)
VISIBILITY 4-way tie for second
1. Community challenge to join Sustainable Silicon Valley and/or CA Climate Action Registry
2. LED tree lights for University Ave.
3. Provide incentives to all of the top energy users in Palo Alto to report greenhouse gases with a recognized agency that could include Sustainable Silicon Valley, CA Climate Action Registry, and/or other recognized national or international reporting groups
4. Have carbon neutral homes tour
5. Solar garden (central solar PV system with subscribers)

Table 2. Energy Subcommittee “top twelve” ideas summary.

	Top 3	Category	Purpose	Type	Who
1. Community challenge to join Sustainable Silicon Valley and/or CA Climate Action Registry (see also #9)	Combined Time Visibility	Inventory	Education	Policy	Community
2. Actively advertise available tax credits and incentives (see CPAU website)	Combined Ease Time	Information	Education	Project	Utilities
3. LED tree lights for University Avenue.	Combined Ease Time Visibility	Efficiency Measure	Efficiency	Project	Gov't
4. Provide PaloAltoGreen-like option to invest in offsets for natural gas use or climate neutral utility bills.	Combined	Energy Pricing	Offsets	Rate	Utilities
5. Provide incentives for companies to purchase Palo Alto Green – inverse tiered rate structure for PA Green, the more you buy the cheaper it is per unit.	Combined	Energy Pricing	Energy Supply	Rate	Utilities
6. Match energy-related GHG emissions with offsets (individuals and companies)	Impact	Offsets	Offsets	Policy	Community
7. Meet all energy load growth with efficiency and renewable resources	Impact	Green Power	Energy Supply	Policy	Utilities
8. Sign up for Palo Alto Green – e.g. set goal to sign up 50% of electricity to be PaloAltoGreen	Impact	Green Power	Energy Supply	Policy	Utilities & Customers
9. Provide incentives to all of the top energy users in Palo Alto to report greenhouse gases with a recognized agency that could include Sustainable Silicon Valley, CA Climate Action Registry, and/or other recognized national or international reporting groups	Visibility	Inventory	Education	Policy	Gov't & Community
10. Have carbon neutral homes tour	Visibility	Information	Education	Project	Community
11. Solar garden (central solar PV system with subscribers)	Visibility	Solar Measure	Solar	Project	Utilities
12. Expand City urban forest management/master plan to recognize energy savings and CO ₂ sequestration benefits	None	Urban Forest	Trees	Policy	Gov't & Utilities

APPENDIX A: Summary of Energy Subcommittee “Short List” Recommendations

1. Inventory Greenhouse Gas Sources.
 - a. Community challenge or incentives to report greenhouse gases with a recognized agency such as Sustainable Silicon Valley, California Climate Action registry, and/or other recognized national or international reporting groups.
2. Information (will have some overlap with Education group)
 - a. Actively advertise available tax credits and incentives (such as the current CPAU website)
 - b. Electricity use and gas use displays in the home and business to encourage conservation, show energy, cost and environmental impacts.
 - c. Sponsor a “carbon neutral” homes tour.
 - d. Sponsor energy and the environment reference library section.
3. Building & Planning (will have some overlap with Buildings group)
 - a. “Energy Budget”: Require that homes above a certain size be designed to use energy no more than some size (e.g. 3,000 sq ft house) at Title 24 standards, and possibly something similar for businesses.
 - b. Add efficiency checklist as standard in planning and ARB reviews.
 - c. Zero energy home incentives.
 - d. Building permit review “fast lane” for low-energy buildings and energy efficiency improvements.
 - e. RECO for rental properties (Residential Energy Conservation Ordinance)
 - f. Require solar option on developments over 5 homes rather than 50.
 - g. Design for LEED/Green Points for new city buildings.
 - h. Build a zero-energy home and use for a B&B or Utility Director’s home! Maybe team with Sunset Magazine or other partner.
4. Energy Pricing
 - a. Time of use rates that incorporate CO₂ impacts.
 - b. Enhance tiered rate structures to encourage electricity and natural gas conservation - add extra retail rate tier(s) to highest energy users.
 - c. Provide incentives for companies to purchase Palo Alto Green – inverse tiered rate structure -- the more you buy the cheaper it is per unit.
 - d. Provide voluntary retail rate option to invest in offsets for natural gas use or climate neutral utility bills.
 - e. Discount utility rates for energy star homes.
 - f. Special rates for electric vehicles
5. Efficiency Programs and Investments
 - a. Reduce electric and gas distribution system losses. Reducing electric distribution system losses from 3.6% to 2.6% could reduce GHG

emissions by 3,600 tonnes per year (tpy). Estimated gas system leakage of 1.4% is equivalent to 19,000 tpy CO₂ equivalent as methane.

- b. Join Energy Star Partnership - both City government and commercial businesses.
 - c. Acterra Cool Homes program to install compact fluorescent lights (CFLs), low flow shower heads, programmable thermostats, water heater blankets, close lines, adjust water heater temp. and other energy efficiency measures.
 - d. Recommission commercial and public facilities to ensure that efficiency measures already taken are working properly.
 - e. Install high-efficiency lighting and controls. Lighting is the number one electric end-use and has the highest potential for cost-effective energy efficiency reductions.
 - f. Increase use of clotheslines. Natural gas use for residential laundry emits approximately 2,200 tpy.
 - g. LED holiday lights for University Avenue would save up to 10-20 tonnes CO₂ per year, but more importantly could have a striking visibility and strategic impact if combined with educational information.
6. Solar Energy Programs and Investments
- a. Expand solar programs to install solar water, heating, hybrid lighting, and passive solar design.
 - b. Support “Solar for schools” program
 - c. Install 13 MW of Photovoltaics (Goal implied by Million Solar Roofs Legislation SB1)
 - d. Install solar hot water systems.
 - e. Implement a “Solar Garden” (central PV with subscribers). A solar garden would enable customers without adequate solar resources on their own home or businesses to have solar energy delivered into the CPAU grid from collective action.
 - f. Solar heating for all City and PAUSD pools. Natural gas use for swimming pool heating emits over 4,000 tpy in Palo Alto. Implementing solar sets an example for the community and will save money.
7. Climate Program (tied to GHG emissions directly, not indirectly like solar or efficiency)
- a. Offer solar-type incentives and rebates for GHG reduction from energy use regardless of technology involved.
8. “Low-Carb” Energy: renewables and high efficiency/low emission resources
- a. Meet all energy load growth with efficiency and renewable resources.
 - b. Sign up for Palo Alto Green – e.g. set goal to sign up 50% of load to be PaloAltoGreen. This high level of participation would mostly likely require Renewable Energy Credits and/or a change to non-carbon mix other than 97.5% wind and 2.5% solar.

- c. Deploy clean small-scale distributed generation, including incentives for local renewables and low-net-GHG cogeneration.

9. Urban Forest Management

- a. Expand City urban forest management/master plan to recognize energy savings and CO₂ sequestration benefits.
- b. Enhance utilities' "Right tree in the Right Place" program expanded to accommodate solar access for PV and hot water.
- c. Increase tree canopy coverage for parking lots. Reduces fuel consumption for car air conditioners and heat island effect.

10. Offsets

- a. Utilities purchase GHG offsets equal to the residual GHG content of utilities energy supply offsets (natural gas and electricity).
- b. Individuals and companies purchase GHG offsets equal to the GHG content of utilities energy supply offsets (voluntary).

11. Research

- a. Establish a Green Tech Center to facilitate the commercialization of new technologies. This is a key opportunity for fostering synergies with Stanford, the City and the community. A technology commercialization center would help emerging clean energy and other green technologies overcome significant barriers to market entry by helping them assemble solid management teams, secure appropriate funding, introducing them to a network of Silicon Valley mentors and clean tech contacts and accelerating the adoption of clean products in the market. Other communities have developed similar centers and found substantial economic benefits. Creation of a green tech center can provide new business formation and healthy job growth while helping to solve local, regional and national environmental problems. The clean tech market is expected to grow exponentially in the next few years, and Palo Alto/Stanford has an ideal opportunity to be a leader.

12. Non-utility

- a. Reduce energy used for landscape maintenance, such as landscaping not requiring lawnmowers (no grass) or using goats instead of lawnmowers.

Palo Alto Green Ribbon Task Force Transportation Committee

Final Report



Mark Sabin
Steve Raney
Karl Van Orsdol
Arthur Keller
Tom Kabat
Bruce Hodge
Steve Bishop
Bret Andersen

**Palo Alto, California
December 2006**

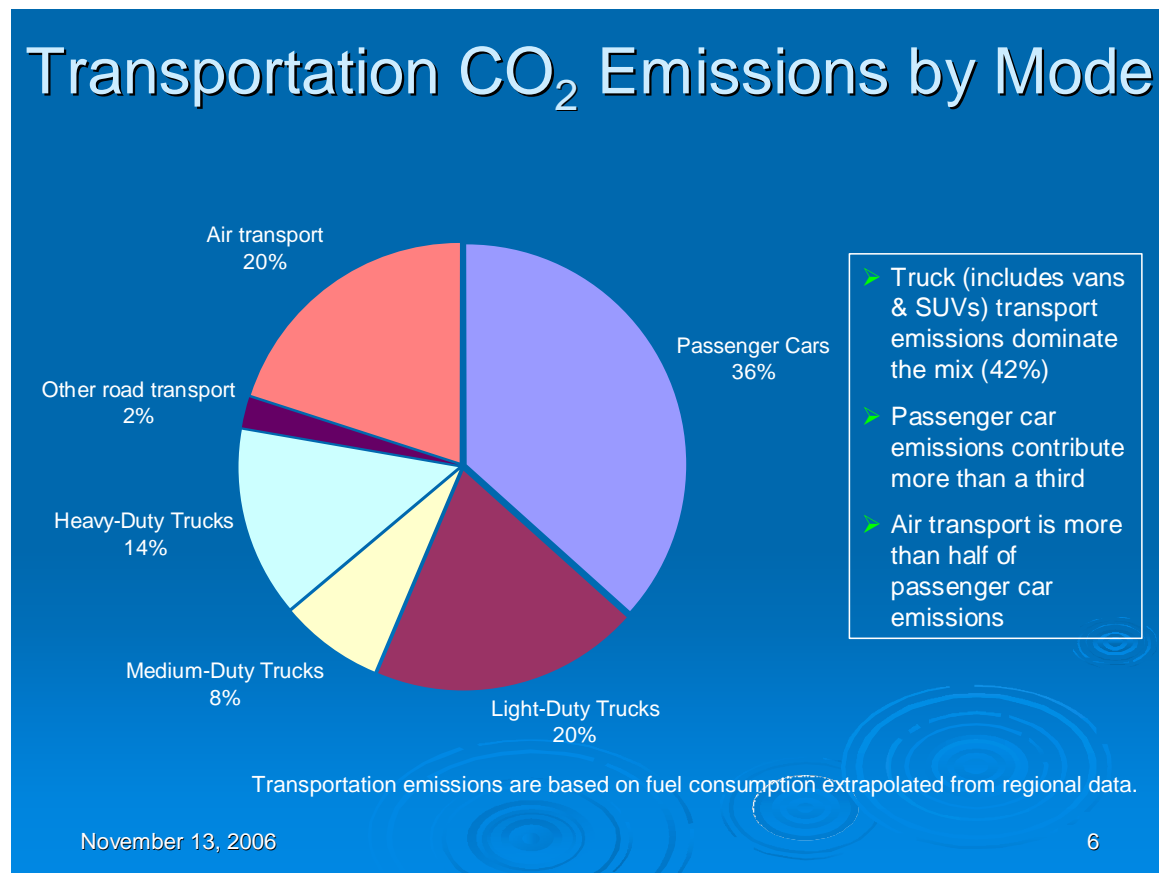
Table of Contents

Introduction	3
Summary of Recommendations:.....	4
Key to Tactic Ratings:.....	4
Acknowledgements:	4
1) Increase biking and walking.....	5
2) Increase Mass Transit Availability	7
3) Electronic Alternatives to Travel	9
4) Increase School Commute Alternatives	13
5) Green Parking Policies	17
6) Promote alternative fuels	21
7) Educate the public on transport emissions	24
8) Encourage local purchasing	26
9) Offset remaining emissions	29
10) Legislative Priorities for Transportation GHG Reduction.....	32
11) Potential Direct Emissions Impact of Recommended Tactics.....	34

Introduction

The U.S. boasts 30 percent of the world's cars and is responsible for almost 50 percent of global car-caused greenhouse-gas emissions, according to Environmental Defense. American-driven cars emit 15 percent more carbon dioxide per mile than the global average (because they get worse gas mileage). Plus, Americans just drive more: 29 percent above the global average.

How does Palo Alto compare with these national statistics? The PA GRTF, Baseline Committee estimated that transportation CO₂ emissions amounted to 51% of all Palo Alto CO₂ emissions. Within transport, passenger cars contribute 37% while trucks and other than cars used for logistics and transport total 44%. Moreover, air travel emissions are more than half the amount coming from passenger cars. It only takes a couple of flights a year to double what a typical person emits in a year's worth of driving.



Can we as Palo Altan's change the situation and substantially reduce our CO₂ emissions in light of these facts? The PA GRTF Transportation Committee recommends a number of actions that it believes could have significant impact. While change is a matter of individual choice and the demand products, services, and infrastructure, the task for government is to make it easy for people to make better choices and to confidently invest in a sustainable future.

Summary of Recommendations:

The committee used its limited time and resources to discover and evaluate many existing and proposed strategies and programs to reduce carbon emissions from transportation. The recommendations grouped under the section headings below represent the committee's consensus view of the most effective actions the City of Palo Alto should consider taking to reduce our community's carbon emissions. Additionally, in each section, other tactics for reducing emissions are suggested as worthy of consideration and should stimulate further thinking in those areas. In each section, *metrics*, *stakeholders*, *challenges* are listed as implementation considerations and *supporting material* provides further explanation of certain tactics and related references.

- 1) Increase biking and walking
- 2) Increase mass transit availability
- 3) Encourage electronic alternatives to travel
- 4) Improve school commute program
- 5) Implement green parking policies
- 6) Promote alternative fuels
- 7) Educate the public on transport emissions
- 8) Encourage local purchasing
- 9) Offset remaining emissions
- 10) Lobby for policy changes at region, state, and federal levels

Key to Ratings: Recommendations and Tactics in this document may appear listed in tables along with the committee's rating of its Impact on emissions, Difficulty of implementation, and Time to work, where

Impact: 3=most/best. 1=least/worst.

Difficulty: E - easy. M - medium, H - hard.

Time to impact: F - fast. M - medium. S - slow.

Acknowledgements: The transportation committee would like to thank first and foremost, Walt Hays, for his leadership and commitment to the Task Force, and, all those who contributed ideas to this project, including, but not limited to: Mark Sabin, Steve Raney, Karl Van Orsdol, Arthur Keller, Tom Kabat, Bruce Hodge, Steve Bishop, Bret Andersen, and the rest of the Green Ribbon Task Force, Baseline, Building, Energy, and Education Committee members.

1) Increase biking and walking

GOAL: Get more car drivers biking and walking to their destination or to mass transit. Palo Alto has made some progress in this area but there is much more that can be done.

Fun Fact: World's Most Energy Efficient Vehicle? The bicycle. Recently the WorldWatch Institute found that a bicycle consumed only 35 calories per passenger-mile, whereas a car expended a whopping 1,860 calories. Bus and trains fell about midway between, and walking took 3 times as many calories as riding a bike the same distance. Oddly, only 1% of urban travel in the US was by bicycle, a country with 30.6% of adults considered obese. This contrasted with the Netherlands where 28% of urban travel was via a bike, and only 10% were obese.

IMPACT: Moderate. Programs that encourage walking or biking can have moderate to high impact, especially if connected with mass transit access.

DIFFICULTY: Easy. Most programs to encourage biking and walking are easy to implement but dedicated and shared pedestrian access to schools, retail, professional, and government destinations takes an integrated planning approach.

TIME: Fast. Most of the infrastructure needed to support biking and walking can be built rapidly and can immediately increase the number of people using car commute alternatives, especially if focused on areas where demand for more walking/biking facilities is already evident.

RECOMMENDATIONS:

	impact	difficulty	time
Increase bike carriage on mass transit. Overcrowded bike cars on Caltrain Bullet trains demonstrate demand for more mixed bike-transit commute strategies. Usage data on bike carriers on VTA buses might reveal further areas where small investments could increase demand.	3	E	F
Increase bike parking at mass transit stations. Secure bike storage at transit points can also encourage mass transit use.	3	E	F
Create more bike boulevards and other bike friendly improvements. The Bryant Street bike boulevard is a successful example of a citizen initiative to increase bike usage in Palo Alto. The boulevard provides a direct and safe corridor across the whole city and could be duplicated in for other high traffic routes.	2	E	F
Create pedestrian retail zones with enhanced transit, biking & walking access. See also the "Green Parking Policies" section.	1	E	F

CPA should integrate planning for bike and pedestrian friendly crossings at all future street improvement, repaving projects. A request process should formally take public input in this specific area. Tactics include:

- more stoplights sensitive to bikes
- single car lane through-fares with wide bike paths (e.g. Charleston)
- pedestrian & bike only street sections in retail areas. Better bike parking downtown and at businesses
- over/underpasses to create bike/walk short cuts across otherwise impassible streets/rail lines to transit or other popular destinations

OTHER TACTICS:

	impact	difficulty	time
CPA can focus more effort on improving bike and pedestrian access and bike carriers on VTA, CalTrain, and BART points within Palo Alto.	2	E	F
Require showers at all businesses – Any bicycle commute longer than about 20 minutes requires a shower prior to office work. Local businesses that generate significant parking demand should make such facilities available to their employees, directly or through health clubs, etc.	2	H	S
CPA Website should provide information about cycling options within and around the city. It should also support other websites dedicated to addressing the topic such as the bicycling section of 511.org	3	E	S

METRICS: Racks or other facilities installed, bike usage rate surveys, bike space utilization on Caltrain, VTA, and at transit stations.

STAKEHOLDERS: Caltrain, VTA, PA public works (roads), Schools, Palo Alto Bicycle Advisory Committee

OBSTACLES: Funding for equipment on VTA, more space on Caltrain (esp. express trains), City Funding for more bike paths and bike storage/racks at transit points, Business community acceptance of shower requirements, public resistance to restricting traffic for the benefit of biking

SUPPORTING MATERIAL:

Practical example approaches to encourage cycling:

- PA Safe Routes to School Information: <http://www.city.palo-alto.ca.us/transportation-division/safe-index.html>
- Palo Alto's adopted Bicycle Master Plan: <http://www.cityofpaloalto.org/transportation-division/bike-trans-plan.html>
- Palo Alto Bicycle Advisory Committee: <http://www.cityofpaloalto.org/transportation-division/bike-committee.html>
- Bicycle Transportation Alliance of Oregon: <http://www.bta4bikes.org/>
- City of Portland Transportation Office – bicycling support program examples: <http://www.portlandonline.com/transportation/index.cfm?c=dehnc>

2) Increase Mass Transit Availability

GOAL: Improve both local and regional mass transit options and functionality.

Mass transit is often cited as way to reduce GHG (Green House Gas) emissions. The challenge is to deploy systems that can function in lower density areas like the Peninsula and Santa Clara valley. Palo Alto has options to improve local transit with it's own projects it but must also make an effort influence regional transit authorities.

IMPACT: Moderate. The impact is moderate in Palo Alto due to entrenched commuter modalities and the difficulties of mass transit in low-density areas.

DIFFICULTY: Moderate. A mix of easy, moderate and difficult solutions is available.

TIME: Slow+. Implementation time is a mix of timelines depending of the scale of the project and CPA's lack of control over regional networks.

RECOMMENDATIONS:

	impact	difficulty	Time
Expand Palo Alto shuttle service, with more routes and greater frequency.	2	M	F
Improve system interconnectivity with Caltrain, so that buses and shuttles are synchronized with arriving and departing trains.	2	E	F
Lobby for multi-modal passes and/or tickets that work across transit systems. One implementation of this could be based on the use of personal transponders (similar to FasTrak system used at Bay Area toll plazas).	3	M	S

OTHER TACTICS:

	impact	difficulty	Time
Launch public awareness campaign	2	E	E
Require local employers to offer financial incentives for taking public transit. For local examples, Stanford University has implemented a number of measures that have received praise.	1	E	F
Make VTA buses free within Palo Alto or encourage distribution of bus passes by local employers.	2	M	F
Sync up existing transit, traffic, and weather systems into city sponsored info service.	3	H	S+
Investigate the deployment of an innovative bus based transit solution designed for low density communities. See the supporting material below for more info.	2	M	S+
Lobby for extending BART around the Bay	1	H	S
Lobby for a statewide Bullet train system that would connect the major metropolitan areas.	1	M	S

	impact	difficulty	Time
Lobby for an increase in the frequency of Caltrain express trains.	1	H	S
Lobby for increased grade separations for Caltrain (to facilitate increase in Caltrain frequency, Bullet Trains, and cross bicycling and walking)	2	H	S
Promote comparison table from 511.org showing each area employer's support activities for different commute modes. Lets employers see where they stand and how to improve.	2	E	F
Enable use of Alma/High Garage (Word Garage) as Caltrain parking lot overflow by installing a Day Pass vending machine.	2	E	F

METRICS: Transit usage, call stream analysis, percentage reduction of single occupant vehicles

STAKEHOLDERS: Caltrain, VTA, Cellular companies, MTC, Caltrans, US DoT.

OBSTACLES: Synchronizing disparate transit information, funding.

SUPPORTING MATERIAL:

Here is an article that talks about one innovative solution that was pioneered in Curitiba, Brazil by its mayor, Jaime Lerner.

<http://www.sierraclub.org/sierra/200601/interview.asp>

There are a lot of advantages to this kind of system, particularly the flexibility and minimal capital cost. A system like this might be better suited for the low-density portions of the Bay Area as opposed to traditional transit lines.

For more reading: http://en.wikipedia.org/wiki/Bus_Rapid_Transit

3) Electronic Alternatives to Travel

GOAL: Reduce carbon emissions from vehicles and passenger planes through the increased use of high speed web access and ultimately “live like” video conferencing as an alternative to commuting and traveling.

A person taking two round trip flights to the east coast will produce about the same amount of carbon as one person driving a car 12,000 miles (the average amount an American drives per year). Clearly, substituting electronic conferencing for travel would be an effective means of reducing carbon emissions. Technology now exists to provide a realistic face-to-face meeting experience from multiple locations with little or no discernible delay in video or audio transmission. Unfortunately, the hardware is still very expensive, and is generally accessed through expensive dedicated networks managed by the hardware manufacturer. The technology also requires considerable bandwidth and there is no standard operating protocol between manufacturers.

Telecommuting is another means of reducing carbon emissions. Web-meetings and open text, voice, and video chat are common today and need to be more heavily used as commute and travel alternatives. Widely available high speed internet network access would greatly support this since it by enabling two-way digital video communications support for multiple people from multiple locations along with the transmission of substantial volumes of data.

The high potential impact on carbon emissions of this strategy adds new urgency and economic justification to city and community efforts to make video-capable high speed internet access available to all local residents and businesses.

IMPACT: High. High impact because avoiding travel altogether causes the greatest reductions in carbon emissions.

DIFFICULTY: Easy. Mainly requires cultural changes, as opposed to new vehicles or fuels.

TIME: Fast. Implementation can be almost instantaneous as connections are added.

RECOMMENDATIONS:

	impact	difficulty	time
Facilitate high speed reliable broadband access to homes and businesses	3	H	S
Partner with hotels to support videoconferencing in hotel conference rooms	2	M	F
Include videoconferencing capabilities in libraries	2	H	S
Create telecommuting incentives for companies	2	M	M

OTHER TACTICS:

	impact	difficulty	time
Web/Video Conferencing			
Encourage public private cooperation in building web conferencing facilities for small and home based business and residential market.	3	H	S
Collect videoconferencing best practices for setup and operations	1	M	M
Consider building or zoning incentives for business who build web conferencing facilities for their employees, other business and the public.	3	H	S
Offer carbon offsets to employers and individuals who use web conferencing.	2	H	S
Explore efficacy of block purchases of unused web conferencing time from existing web conferencing facilities by public/private cooperatives.	1	H	S
Telecommuting			
Reduce parking requirements for successful telecommute programs and impose annual impact fees for unsuccessful TDM programs	3	M	M
Make telecommuting a Green Biz Certification Req.	2	E	F
Promote EPA's Best Workplaces for Commuters program	2	E	F
Run census on home-based businesses	2	M	M
Lobby for increased (carbon) tax on fuel and air travel	1	H	S

METRICS

- Utilization of videoconferencing facilities, percentage of telecommuters, quantity of home-based businesses.
- Number of Companies in Palo Alto which currently have on site web conferencing facilities.
- Number of business in Palo Alto who currently offer web conferencing to business and the public.

- Companies in Palo Alto without on-site web conferencing facilities to determine potential need (i.e. frequency and nature of employee travel) and reasons for not using web conferencing.
- Number of home based business in Palo Alto and nature and use of air and auto travel.
- Use and nature of web conferencing by small and home based business
- Frequency and nature of travel by city employees.
- Frequency and nature of web conferencing by city employees.

STAKEHOLDERS:

- City government, business community, local utility, residents.
- employees, EPA, Transportation Demand Management coordinators,

OBSTACLES:

- Telecommunication companies, existing, for-profit web conferencing providers,
- Wifi providers, Expenditures to provide city-wide fiber network, expenditures for purchase and administration of web conferencing facilities.
- Costs, legislation, monitoring.

SUPPORTING MATERIAL:

Cost of Equipment: Web conferencing has traditionally been an unattractive alternative to traveling to meetings because of poor video and audio transmission quality which made for an inferior interaction experience. Fortunately, the technology has advanced to the point where interaction is of such a quality that lag time is nearly indiscernible and multiple sites can be included in the same meeting. Unfortunately, this comes at a considerable cost for the hardware (in the hundreds of thousands of dollars) and the annual costs for managing the service which the manufacturer provides on their network. Each manufacturer has its own network so you can only interface with companies who are on that network. Companies are working on interoperability between networks but that will happen some time in the future. This cost factor makes the technology out of reach for most businesses to acquire the equipment or prohibitively expensive (\$500.00 or more per hour in some cases) to use it from a company who offers web conferencing to the public.

Need for high quality fiber network: If web conferencing is to be a viable option to travel, it is critical that the transmission be of a quality high enough to realistically simulate being in the same room. The new generation technology has made and will make great strides toward this but it needs a T3 or better transmission capability to accomplish it. This level of band width will probably never be achieved with wifi technology and is most easily accomplished with a fiber network. Another plus for fiber to the home is that it insures that local residents who are telecommuting have more than adequate up and down band width for any work they may be performing. This also ensures that band width is not an issue that would compromise their ability to perform their work at home. It would also enable them to collaborate with other employees at other sites without the impediment of poor or slow data transmission because of the large band width and fewer gateways to go through. Palo Alto has been investigating the efficacy of this type of network for some time now. If Palo Alto is to offer a system which will be an effective real

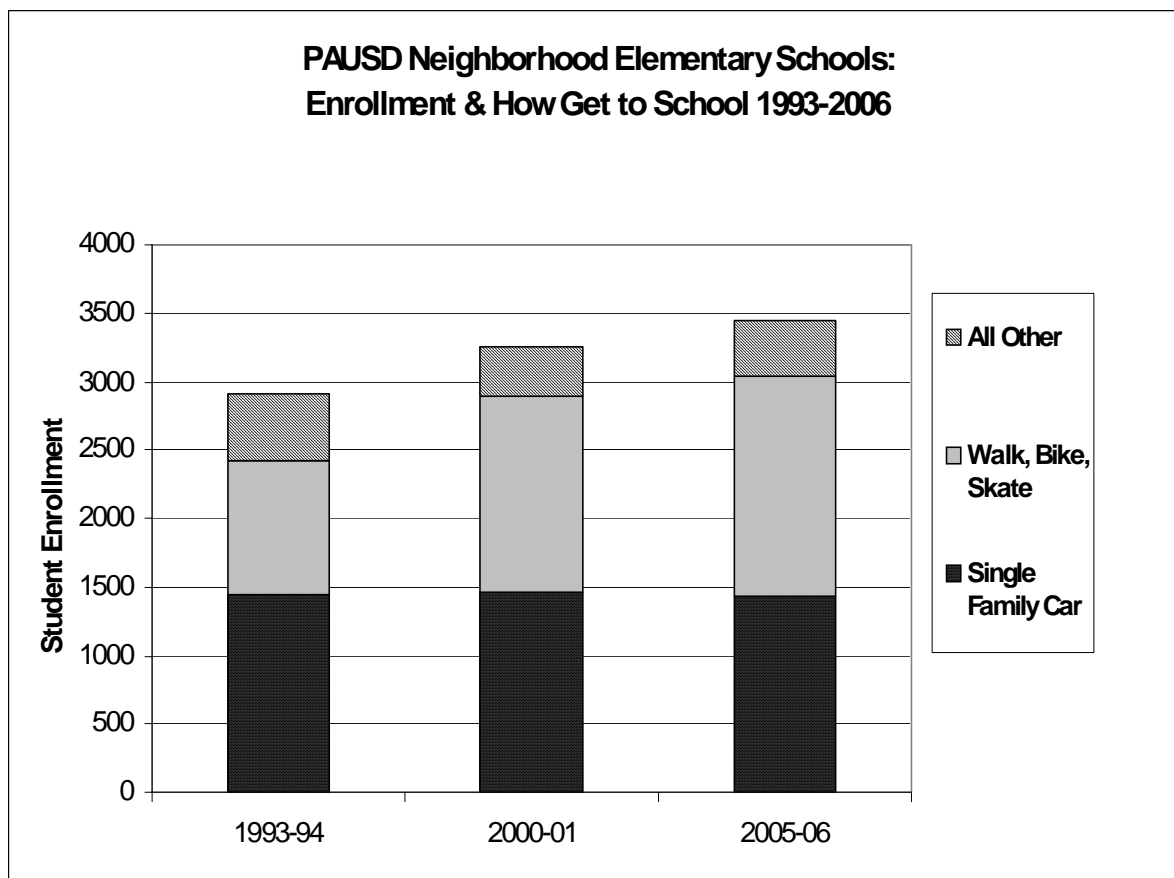
time alternative, with a quality competitive with and comparable to the best overseas networks, then a quality city wide fiber network is probably the best option.

Public/Private Cooperation: Palo Alto is a community with a disproportionate number of working residents who work in Management or Professional occupations. These types of occupations also do an above average amount of work related travel. Because of this, there is a substantial opportunity to reduce the level of CO2 production if the city or local companies could offer a cost effective high quality alternative to travel to Palo Altans and the Palo Alto workforce. This is why it is important to investigate the viability of creating public/private initiatives to provide more cost effective high quality web conferencing facilities to a broader array of potential users and to provide incentives to business and developers, who are looking to lower costs, increase productivity and provide world class competitive facilities for the workforce.

4) Increase School Commute Alternatives

GOAL: Reduce the number of cars driving kids to school and make Palo Alto a leader in safe, healthy, and green school commute options.

Many children still have to travel along or across busy streets to get to their nearby school and, with very limited district busing, parents see no other transport alternative today but the car. The situation is improving year by year with the successful Safe Routes to School programs. The chart below shows the elementary school trend where today about 43% of kids bike or walk to school. More effort is needed to build on this coordinated parent, city, and district approach.



IMPACT: Moderate. While school commutes are typically short, they can be a significant contributor to CO2 by causing heavy traffic and idling emissions during peak morning commute hours in the city. Moreover, walking, biking, busing and car pooling sets a great example for our youth that will carry forward these lifelong habits for the benefit of the environmental, safety and health

DIFFICULTY: Easy. The short commute distances make it easy to travel by bike or by foot and more a question of safety and convenience for parents. Control over

practically the whole transit path also means the city, district, and parents control the means and ends of any solution.

TIME: Fast. Adoption of the ready alternatives of biking, walking, and local busing can quickly adopted by local families with concerted program development and promotion.

RECOMMENDATIONS:

	impact	difficulty	Time
Develop more busing programs. Current busing by the city and schools is severely limited. More can be done to build city sponsored shuttles (e.g. Go Fast bus for Gunn), VTA, or PAUSD busing solutions for high traffic routes. Consider parent user fees to fund useful solutions. The city needs to track more data in this area.	3	E	F
Support the local Safe Routes to School priorities and programs. This program has shown success by increasing biking, walking, and busing and mostly through grass roots efforts. Volunteers at each school promote commute alternatives and work with the district and City for positive change. This program addresses all modes such as: <ul style="list-style-type: none"> • Walking and Biking • Busing • Carpooling This group has a network in place and can help guide increased efforts to measure and improve the major school commute corridors like the successful Charleston / Arastradero redevelopment.	3	E	M
Encourage PAUSD to take responsibility for reducing emissions. The district should be encouraged to adopt goals and measures for CO2 reductions from school commuting. District busing is now very limited given funding concerns. <ul style="list-style-type: none"> • The district could significantly increase its efforts to create more busing, biking, walking when planning new facilities/access (e.g. foot and bike paths and bike parking), school start and end times, and academic "Choice" programs that require cross town commuting. • The existing City/School/Parent forums could work to address these concerns with the help of stronger leadership on the city side. In this way PAUSD can overcome school program funding and leadership deficits at the State level. 	2	H	S

OTHER TACTICS:

More and better walking paths to schools	2	H	M
Facilitate carpooling through coordinated programs	3	M	F
Empower school commute coordinators	3	M	M
Promote environmental awareness and change in schools	2	E	M
Provide covered and secured bike parking at all schools	3	M	M
Provide transit surge capacity on days of inclement weather	2	M	M
Charge developers a transportation impact fee that pays for shuttles	3	M	M
Create endowment for school bus shuttles	2	H	S

METRICS:

- Traffic counts on streets near schools (Transportation Division of City) - Streets with warrants for crossing guards near each school, and one or two arterials near each school. Compare this data with summer counts for each street.
- Transportation Surveys: E.g. Gunn High School has two transportation surveys and does some observation counts of transportation to school; one is an all mode count. Counts at bike parking areas of schools. Counts for rainy vs. clear days.
- Walk to School Day PTA transportation surveys from elementary schools.
- Palo Alto Shuttle drivers have done counts on riders to different schools.
- VTA also conducts rider counts. (88 may be the only one which serves a school, Gunn, but there may be other public bus service to schools.)

STAKEHOLDERS: Parents, teachers, city transportation officials, VTA, Palo Alto Shuttle, local businesses, housing developers

OBSTACLES: Costs, need for nexus study, allocation of charges.

SUPPORTING MATERIAL and INFORMATION SOURCES:

- *Palo Alto Safe Routes to School Program*. PTA contact: Penny Ellson. Information at www.saferoutesinfo.org See also the article about this program by YORIKO KISHIMOTO published in the Mercury News at <http://www.mercurynews.com:80/mld/mercurynews/news/15899791.htm>
- City of Palo Alto – Transportation, Commute Alternative - Kathy Durham, Gayle Likens. Programs to enforce, engineer, encourage commute alternatives and educate people about them.
- Elementary School Traffic Patterns/Busing Proposals – Joan Marx, active PA resident
- PAUSD Programs. Director of Auxiliary (incl. Transport) Services. - Kathy Durkin

Some Existing PAUSD Commute Alternative Programs

Source: Kathy Durkin, PAUSD

- Busing for Voluntary Transfer (including EPA kids) – 6 routes – 550 kids
- Busing for outlying areas – Parent Pay – 9 routes – 150 kids
- Busing for Special Needs students– 14 routes
- PAUSD owns 6 LNG buses to serve the above routes and is very satisfied
- City X-town Shuttle – serves Paly, Gunn, Jordan - shares funding with CPA
- Some funding for Bike / Walk to School efforts by the PTA for Traffic Safety Education programs with content from the Palo Alto Safe Routes to School Program

5) Green Parking Policies

GOAL: Encourage people to drive less by modifying parking policies.

IMPACT: Moderate

DIFFICULTY: Moderate

TIME: Moderate to Fast

RECOMMENDATIONS:

	impact	difficulty	Time
Expand parking benefits for green vehicles. Create more free green vehicle spaces, extend parking times for green vehicles. Provide electric outlets and free charging, etc.	1	E	F
Create pedestrian (i.e. automobile free) retail zones with enhanced transit, biking & walking access.	2	H	S
Reduce parking requirements for successful telecommute programs. Discourage unsuccessful Transport Demand Management programs.	2	M	M

OTHER TACTICS:

	impact	difficulty	time
Bring parking charges to offices in Palo Alto This would have a big impact but requires Palo Alto to pioneer a parking charges policy for other cities to follow.	3	H	S
Encourage offices to implement parking cashout programs. Parking cashout is where employer gives alternative commuter the value of the freed up parking space. A parking district could lease the freed up space from employer for more retail/restaurant parking or auto dealer car storage etc.	3	H	S
Parking for green transportation			
• REAL compact car parking ('Smart' Car, electric cars)	1	H	S
• Free vanpool parking in downtown lots	1	E	F
• Free, secured parking for scooters, bikes	1	E	F
• Free parking for scooters, bikes	1	E	F
More parking meters in downtown, in parking lots	3	E	F
Make train accessible/high traffic streets more expensive to park on (except for those driving to train station to use train)	3	E	F
Permit parking for residents on residential streets near downtown and limited 2 hr parking for the rest.	3	H	S
REAL compact car parking ('Smart' Car, electric cars)	1	H	S
Free vanpool parking in downtown lots	1	E	F

METRICS:

- Measure the “before” versus “after” change in commute mode share of non-SOV commutes for the affected offices. (Use data such as BATS or CTPP). Downtown retail revenue, parking meter revenue
- Should probably conduct parking occupancy studies to adjust the amount of green parking based on real, measured demand.

STAKEHOLDERS:

- Office landowners, office leaseholders, office workers
- City councils: Palo Alto, Mountain View , Santa Clara , Cupertino , Sunnyvale , San Jose , Menlo Park , and Redwood City
- Other U.S. “cool cities” that are also working on climate protection and have significant office space.
- Silicon Valley business interests (as represented by Silicon Valley Leadership Group, Silicon Valley Chamber of Commerce, and Bay Area Council)
- The Palo Alto Chamber of Commerce
- Palo Alto voters
- Downtown businesses
- Parking enforcement
- People who park downtown
- Police

OBSTACLES:

-
- Cost, implementation hassles, business skepticism. Local residents object to spillover parking in their neighborhoods caused by expensive/limited city or business parking

SUPPORTING MATERIAL:

Green parking:

- “Provide Parking and Charging Facilities For Electric Cars.”
<http://www.greenbuildings.santa-monica.org/transportation/parkingcharging.html>
- Highly visible parking spaces for green vehicles help to increase public consciousness about climate protection.

Create pedestrian retail zones with enhanced transit, biking & walking access:

Big changes like this do take time, but since we are envisioning Palo Alto more than 20 years out, we have that luxury. This kind of thinking helps set the framework of what Palo Alto might look like in a reduced GHG world and inspire other ideas to that end.

Don Weden’s Winds of Change LEDs could incorporate pedestrian-only streets. “Livability Enhanced Districts,” or LEDs: 20 to 30 blocks of self-contained, walkable neighborhoods with containing services, park facilities and housing.

PA Weekly, February 1, 2006. Editorial: ‘Winds of Change’ conference featuring Don Weden, a long-time senior planning official with Santa Clara County,
http://www.paloaltoonline.com/weekly/story.php?story_id=136

See the history of Boulder’s Pearl Street pedestrian mall, instituted in 1977:
<http://www.getboulder.com/25th/pearlstreet.html>. Some nice pictures of the Boulder pedestrian mall: <http://www.normankoren.com/Boulder.html>

Examples of employer programs for parking and commute alternatives:

- Commuter Benefit Briefs: <http://www.bwc.gov/employ/benefits.htm>
- Parking Cash Out: <http://www.bwc.gov/pdf/parkingcash.pdf>

Paid parking at offices: Paid parking at offices reduces commute trips by 23%, producing very large traffic and CO2 reduction. This is a very effective policy that is not popular. Are there “clever policy tricks” to bring this about? Can we help cities “jump in together” with small steps, making this policy more palatable? Could cities synchronize their actions to reduce risk? Here is a “three-pager” with details of such a proposal: <http://www.cities21.org/paidParking.htm>

Impact:

- Net office worker commute mode shift away from SOV commuting: 23.6%
- Annual CO2 reduction for Palo Alto office paid parking: 44MM pounds, 20,000 metric tonnes
- Assuming the policy spreads throughout Silicon Valley : 793MM annual pounds of CO2
- Assuming the policy spreads throughout the U.S. : 15.8BB annual pounds of CO2, 7.1 MM metric tonnes
- New land value provided to Palo Alto office landowners: \$161MM

“Turning Small Change Into Big Changes, Douglas Kolozsvari and Donald Shoup.”

University of California Transportation Center’s Access Magazine, Fall 2003, [http://www.uctc.net/scripts/access.pl?23/Access 23 - 02 - Small Change into Big Change.pdf](http://www.uctc.net/scripts/access.pl?23/Access%2023-02-Small%20Change.pdf). Suggests meter revenue be used for public improvements to increase the attractiveness of retail shopping areas. This article suggests setting a pricing level to minimize cruising for parking spaces – this will provide a small CO2 reduction. Kolozsvari and Shoup argue that this policy has net economic development benefit.

High-tech parking meter implementation in downtown Berkeley:

<http://www.ci.berkeley.ca.us/transportation/Parking/ParkingMeters.html> . “These new ParkeEZ Stations will make parking on the streets of Berkeley easier and more convenient. After paying by coins, credit card or debit card, visitors receive a special ticket from the machine that is then placed in the vehicle window.

“Permit parking for downtown workers in two hour spaces” means parking for downtown Palo Alto based businesses, whose employees often park in two hour parking and move their car every two hours (like IDEO). Permits made easy (like EcoPasses for Caltrain) might discourage frequent car starts, but still discourage driving (a fine line). This could be applied to non-residential downtown areas, current two hour parking zones and other business access lots.

Permit parking for residents on residential streets near downtown and limited 2 hr parking for the rest. The idea is to establish parking permit areas with permits available at zero to low cost to Residents to allow them to store cars on public streets in their neighborhood. And to ticket non-permitted cars parked longer than an acceptable time. This would put pressure on employees to either use alternative transport or take the free parking offered by employer in lieu of the parking cashout offer. With permit parking established in surrounding area employers can offer cash instead of free parking to help meet employee transport needs.

6) Promote alternative fuels

GOAL: Improve the efficiency and lower emissions from vehicles in the City and the general public.

IMPACT: Moderate. Programs that encourage the use of alternative can have moderate to high impact, especially if integrated into the City Government's purchasing plans and fleet management.

DIFFICULTY: Easy/Difficult. Encouraging the use of alternative fuels is relatively easy for City Government, but more difficult and evolutionary for the general public.

TIME: Fast/Slow. Encouraging the use of alternative fuels can occur very fast for City Government (within 2 years), but more slowly for the general public (2 - 10 years).

RECOMMENDATIONS:

	impact	difficulty	time
Change city purchasing policy to factor in clean energy/efficiency with special attention to clean energy vehicle procurement	2	E	F
Enhance the City's ability to promote alternative fuels within the City	2	E	F
Institute parking benefits for green vehicles. See also the "Green Parking Policies" section.	1	E	F

OTHER TACTICS:

	impact	difficulty	time
Create incentives bio-fuels infrastructure	1	H	S
Create first bay area biofuels gas station in PA	1	E	F
Endorse proposed feebate programs for vehicles based on emissions	2	H	S
Time of Use electric metering for electric and plug-in hybrid vehicles	1	M	M
Increase low electric rate limit for those with electric and plug-in hybrid vehicles	1	E	F
Partner with the Post Office to partially fund or fuel alternative fuel or hybrid or electric postal vehicles	1	M	M
Join with Plug-in Partners. The City should promise to purchase of a fleet of plug-in hybrid vehicles once an automaker begins producing such cars commercially	1	E	F

SUPPORTING MATERIAL:

Promotion of alternative fuels to power transportation should focus on two primary goals:

- encouraging the City of Palo Alto to take the lead as a clean City Government
- enhancing the City's ability to promote alternative fuels within the City

Within City Government: The City is strongly encouraged to focus on two tactics to become a leader in environmental sustainability. Overall, City Council approval for a revised purchasing policy to include environmental values, recyclability of products, and reduced environmental degradation from the City's use of products would provide numerous environmental benefits. A comprehensive purchasing policy should include life cycle costing of devices and the energy they consume as well as the explicit external costs for pollution created. Products and devices would be selected that minimize the total life cycle cost, not solely the lowest bid. In the transportation sector, such a clean purchasing policy would drive the City to accelerate replacement its current aging fleet of cars with hybrids or other low or zero emission vehicles as well as use offsets for all City business related air travel. The city should follow the example of other forward looking communities like Berkeley and Marin County which have already announced "soft orders" for 100% electric or plug in hybrids vehicles. In the heavy vehicle component of the fleet, the City needs to accelerate its use of biodiesel with a goal of 100% biodiesel usage within 5 years. With regard to City buses, a goal could be the conversion of all vehicles to hybrid, biodiesel, or electric within 5 years.

Within the Community: The city has the opportunity to serve as a catalyst to encourage clean vehicle usage by its residents and businesses. For example, extended parking permits (discussed elsewhere), and "fee-bate" systems can encourage residents to use low emission vehicles within the City. In addition, as the City is currently evaluating the option, the MSC can serve as a catalyst for clean fuel by making available on market basis clean fuels used in its fleet to residents. Such a "PA-biodiesel" or "PA-ethanol" would lower the switching costs for residents wanting to use alternative fuel vehicles. Of course, corn-based ethanol production is of questionable value, but it is a transitional fuel to the future potential availability of cellulosic ethanol.

METRICS:

- Percentage of City vehicles with hybrid or ZEV technology
- Percentage of bio-diesel: diesel used by City
- Dollar amount of clean energy fuel purchases by city and Residents
- Implementation of Comprehensive purchasing policy.

STAKEHOLDERS:

City: Administration – Budget and Purchasing, Utilities, Public Works

OBSTACLES:

Dollars required over and above current expenditures.

SUPPORTING MATERIAL:

Create first bay area biofuels gas station in PA to offset emissions from regular gas burning vehicles. Some stations already offer more than the minimum required amount of biofuel in their gasoline. This proposal is to create a gas station that has zero net carbon for transport fuels. It would offer a variety of biofuels (and fossil fuels with embedded offset pricing) and would purchase 100% Green electricity for in-station uses. An individual or group could make a business plan and either pursue it themselves or offer it in person or on the web for others to consider adopting. Developing the business plan could be easy by submitting the idea to a local business school as a project.

7) Educate the public on transport emissions

GOAL: Encourage people to drive, fly, and consume less by providing access to web-based educational tools that make the connections between transport and carbon emissions.

More than half of Palo Alto CO₂ emissions are caused by road and air transport.

IMPACT: Moderate. Currently, most people are unaware of the relative contributions of their activities with respect to GHG emissions. Education is key to build awareness of both the problem and potential solutions.

DIFFICULTY: Easy. We have many individuals in the community that are highly capable of building web-enabled content.

TIME: Fast. This project could easily have the first phase completed within a year.

RECOMMENDATIONS:

	impact	difficulty	time
<p>City should develop or partner to develop a “Reducing Emissions” portion of the Palo Alto City website.</p> <ul style="list-style-type: none"> The site should include a carbon calculator and make it available on the. It will show the percentage breakdown of carbon emissions by category (road transport, air travel, electricity, gas) and allow comparison with average Palo Alto, California and national figures. The approach will attempt to factor in the “overhead” (i.e. non-personal use) of the transportation sector. Integrate the carbon calculator with a public awareness campaign to educate people about their carbon emissions. Add a household transportation related carbon emissions survey to the website. Households will be encouraged to fill out a privacy-protected survey that collects information about their carbon emissions. The survey will gather various metrics that together can be used to generate a reasonable accurate estimate of the total GHG emissions for the household. Add a carbon-offset clearing-house section that explains the concept of carbon offsets and points users towards existing organizations that sell offsets. 	3	E	F

OTHER TACTICS:

	impact	difficulty	time
Ensure the school curriculum includes education on the sources and impact of GHGs and the individual and community strategies to reduce them.	3	E	S
Use the website to highlight the impact of carbon intensive hobbies on emissions such as skiing in Tahoe, buying and keeping empty cabins, etc.	1	E	F

METRICS: Web site usage, surveys, carbon emission statistics.

STAKEHOLDERS: All Palo Alto citizens.

OBSTACLES: Budget for public awareness campaign and web site development.

The airline and travel industry spends many dollars trying to get people to fly and drive as much as possible.

SUPPORTING MATERIAL:

It will not be hard to find volunteers in the community to contribute the bulk of the effort to make the web site happen. Community newspapers and magazines may be willing to donate advertising space for the campaign. The web site could also contain links to various carbon-offset organizations, solar energy vendors, Palo Alto Green and other resources that could expand as time progresses.

8) Encourage local purchasing

GOAL: Reduce commercial transport emissions

The second largest source of carbon emissions in the transportation sector is large vehicles and aircraft transporting goods from production site to distribution/retail sites. This commercial distribution system also exerts a major influence on the local and regional air quality within Cities and retail centers.

In Palo Alto, 36% of the transport emissions are estimated to be due to commercial road transport.

Researchers estimate that local and regionally sourced meals entailed 4 to 17 times less petroleum consumption and 5 to 17 times less carbon dioxide emissions than a meal bought from the conventional food chain (from Eat Here, a WorldWatch Institute book <http://tinyurl.com/tpbep>).

IMPACT: Moderate. Programs that discourage commercial driving can have moderate impact, but requires a long term commitment of the public and merchants. Any “buy and produce locally” would largely impact the distribution and delivery of goods; the impact on individual consumer’s driving habits would probably be minimal.

DIFFICULTY: Easy to Hard. Education is easy. Encouraging local production and purchasing requires considerable cooperation from merchants and a long term educational program for the public to demand local products.

TIME: Slow to Fast. Education can be rapid. Decreasing the transport portion of consumer goods and foods requires long time lines.

RECOMMENDATIONS:

	impact	difficulty	Time
Palo Alto City website educates Palo Altans on emissions from long distance transport and encourages citizens to buy locally produced goods and locally grown produce. Educate on the positive climate benefits of patronizing local farmer’s markets, which sell local food by definition.	2	E	F
Integrate website with a public awareness campaign: “Buy Local”.	2	M	M
Encourage grocers to work farmers produce in next to their regular supply of “factory” produce.	2	M	M
Encourage consumers to favor vegetables over of meat and unprocessed food over processed food. Both meat and processed food have higher carbon footprints.	3	M	S

OTHER TACTICS:

	impact	difficulty	Time
Create “Grow your own” campaign and build on the recycling center’s “Give and Experience for Christmas (e.g. movie, play, sports event, rather than a physical good)” communications to reduce refuse	2	M	F
Combine efforts to create local buying options with neighboring cities	2	E	F
Encourage less packaging to reduce deliveries	2	H	S
Sponsor a tax on non-recyclable packaging	2	H	S
Encourage consumers to buy produce “in season”	2	M	M

METRICS:

Number or Percentage of items in stores in Palo Alto with Distance Label
 Number of farmers markets in region
 Causal relationship between packaging and reduced deliveries

STAKEHOLDERS:

Store owners in Palo Alto – Fry’s, Whole Foods,
 Best Buy and Home Depot in EPA.
 Manufacturers in Palo Alto – HP
 Mountain View – Costco

OBSTACLES:

Packaging designed for loss reduction, protection, security.
 Can PA implement change on its own without other cities?

Supporting Material:

Local Approach: The City government can provide local incentives to reduce commercial emissions through an aggressive program of encouraging labeling of locally made goods (e.g. within 125 miles) in local food stores, in addition to providing space and support for additional farmers markets. This “buy local” approach to encourage the purchase of foodstuffs made locally could, when combined with other Cities help reduce emissions to a certain extent. It might impact the “pull demand” for food products transported by airplane – especially out of season specialty.

Vegetables and Unprocessed Foods: Both meat and processed foods have a higher carbon footprint than vegetables and unprocessed foods. Take the Ecological Footprint Quiz: <http://www.earthday.net/footprint/index.asp>

9) Offset remaining emissions

GOAL: After reductions, offset emissions from remaining driving on fossil fuel.

Reducing carbon emissions requires difficult decisions and changes in the behavior of all of us. These changes involve driving less, conserving fuel, utilizing non-fossil fuels and other actions listed here in this report. In recent years, attention has been growing in the field of offsets, whereby individuals or corporations can “purchase” a reduction of emissions elsewhere. The purchase funds go to projects that reduce emissions more efficiently.

Offsets have many attractions: increasing people’s attention on their person emissions, funneling investment to cost effective offset programs, permitting individuals to directly contributed to projects reducing carbon emissions.

However, the purchases of offsets can only be considered a tertiary activity and can not replace actual emission reductions we all need to take. Offsets have several drawbacks. An effective offset program requires supervision and verification of actual reductions occurring. There are a myriad of companies and programs offering offsets with a vast arrange of verification and regulatory standards being applied. As such, offsets can be a seductive way of reducing “emissions guilt” without actually having a true impact of climate change.

That being said, there are a number of ways to make procuring offsets easier, more recognized or automatic. Some can be implemented locally by motivated groups, and some can only be implemented statewide.

IMPACT: Moderate

DIFFICULTY: Easy

TIME: Fast

RECOMMENDATIONS:

	impact	difficulty	time
Purchase carbon credits to offset City owned fleet vehicle emissions	1	E	F
Provide incentives to cause businesses to offset carbon emissions in vehicles and travel in general.	1	E	F
Encourage businesses and individuals to purchase carbon offsets when they buy air travel either directly through travel websites or offset firms.	2	E	F

OTHER TACTICS:

	impact	difficulty	time
1) Build carbon offset option into DMV vehicle license renewal.	1	H	S
2) Use parking meter revenues to offset carbon emissions.	1	H	F
3) Create gas tax to purchase carbon credits.	2	H	S
4) Offer carbon offset option at PA gas pumps used to subsidize e-cars.	2	H	S
5) Encourage carbon offset groups and airline Frequent Flyer miles programs to develop "use your miles to buy offsets" program.	1	E	F

The impacts of 1), 3), 5) and 6) are low locally and about 200 times higher when counted statewide. They are Easy to pitch to legislators and businesses, who can act on them, but acceptance is not guaranteed, and the implementing is done by others if accepted.

Encourage carbon offset groups and airline Frequent Flyer miles programs to develop "use your miles to buy offsets" programs

METRICS:

- Tons of carbon offsets purchased by City and Businesses and gas stations,
- Ratio of offset purchases to fossil fuel purchases
- Number of laws passed regarding b) and e)
- Amount of parking meter revenue (or parking permit revenue) used for offset purchases
- Gallons of biofuels sold locally

STAKEHOLDERS: gas station owners, tax payers, city council, DMV, carbon credit companies (TerraPass, Chicago Climate Exchange), legislators, airlines, and travel agencies

OBSTACLES: Funding approval (vote?) competing interests for money, anti parking meter attitudes, anti parking permit attitudes

SUPPORTING MATERIAL:

Feebates: A feebate is a transportation finance initiative imposed by government that charges users of socially undesirable items (e.g. gas-guzzling vehicles) and puts the money towards payments for users of socially desirable items (e.g. hybrid cars). One example of a feebate is proposed in the Rocky Mountain Institute's 2004 publication, "Winning the Oil Endgame." (<http://www.oilendgame.com/>) For each class of car and light truck, a feebate mechanism is used to reward buyers of vehicles that are more fuel efficient than the average vehicle in that class and penalize buyers of less fuel efficient vehicles. This feebate is revenue-neutral, meaning that the amount of money collected through fees (surcharges) equals the amount paid out in rebates (feebate description from <http://en.wikipedia.org/wiki/Feebate>). California State Assemblyman

Ira Ruskin has introduced a bill, AB2791, which would authorize a study for a feebate scheme similar to that described above.

The City could purchase carbon credits to offset City owned fleet vehicle emissions. This would be easy to accomplish once City decides to allocate money to this purpose. City already knows volume of fleet fossil fuel purchased and can estimate volume purchased out of town for City staff trips through reimbursement records. The Carbon emission can be calculated each year and offsets purchased each year after the fact. This could be implemented with about 40 hours per year of record gathering and offset purchasing. Implementing controls on the purchase process could expand to several hundred hours per year.

Purchasing Carbon Offsets for air travel. Individuals and firms can dramatically increase their carbon offsets today by supporting programs which allow travelers to directly purchase greenhouse gas reductions or carbon offsets. .Programs exist at some travel websites and at offset firms that allow travelers to purchase carbon offsets at the time of ticket purchases or offer donations to a carbon offset program. The funds for the purchase of these offsets go directly to programs to limit carbon emissions. The City should encourage its staff to use these for air travel (and include them in the Climate Action Registry reporting and encourage businesses and individuals within Palo Alto to use those offsets as well. For instance, Expedia.com offers offsets on all air trips with three prices for the offsets for "local", transcontinental and transatlantic flights.

10) Legislative Priorities for Transportation GHG Reduction

GOAL: Encourage State and Federal legislation in topic areas that would decrease Transportation's contribution to net GHG emissions.

There are many areas where Palo Alto cannot just “go it alone” and reduce transportation's GHG emissions by local only actions. Palo Alto citizens, staff and political leaders can support state and federal legislation to improve systems and create signals for improved citizen and business GHG emissions performance.

The need for broad based action to reduce emissions is gaining public support and it should be recognized that a carbon tax that raises the cost to the end user of fossil fuels will ultimately lead to the fastest, most economically efficient, and comprehensive solution to excessive transportation emissions. Such a market incentive will automatically launch hundreds of emissions reducing behaviors at the citizen, business, and government levels, far beyond what can be recommended by committees or planned and implemented by communities. Such a tax could be phased in and combined with programs to address social equity concerns and political challenges.

Lobbying for better programs, taxes, infrastructure and services in this and the other cases mentioned below represents potentially huge leverage for Palo Alto lobbying actions as its influence can be effectively much larger than it's proportion of the regional, state, or national population.

IMPACT: High

DIFFICULTY: Hard

TIME: Slow

RECOMMENDATIONS:

- Use Palo Alto initiatives and efforts to gain visibility and more effectively influence Regional, State, and even National policy to reduce GHG emissions in Palo Alto and the wider region.
 - Council should signal willingness to “jump in” provided other cities also commit. Act local, lobby statewide, think national. Undertake national leadership. Greenhouse gas reductions are needed as more than a “personal virtue” practiced by a few dedicated individuals. They are needed worldwide to address a global climate change problem.
- The time to assist with the policy development is now. By acting quickly, local governments can help set legislative agendas that make significant advances on the problems of GHG emissions and preserve local control in the long run.

- Keep in mind AB 32's (Global Warming Solutions Act) large GHG reduction targets that limit emissions to 1990 levels by 2020 will lead to legislative efforts to implement strategies and tactics in pursuit of this ambitious goal.
- Lobby at all levels for increased (carbon) tax on fuel for auto, air, and sea transportation and explore ways to effectively implement similar taxes at local levels.
 - The most effective and efficient way to reduce GHG emissions is to include the full environmental costs of using fossil fuels in the price of the fuel itself. The tax can be used to fund offsets or the transition to cleaner transport but the real value of increasing the price of fuel is the release of free market forces that will automatically motivate people to use cheaper and cleaner alternatives like biking, telecommuting, living closer to work, developing solar cars, and hundreds of others beyond the few mentioned in this paper (and especially in the area of commercial/logistics transport). Although conventional wisdom says this is a "third rail" in energy policy politics, recent surveys show real public willingness to pay for the benefits of clean transportation to reduce the real risks of global warming and foster energy independence.

Summary of Items that could benefit from legislative support:

	impact	difficulty	Time
Lobby at all levels for increased (carbon) tax on fuel for auto, air, and sea transportation.	2	H	S
Increase Bike Carriage on Mass Transit	3	H	S
Change State purchasing policy to factor in clean energy/efficiency with special attention to clean energy vehicle procurement	3	E	F
Create incentives bio-fuels infrastructure	3	M	S
Endorse proposed fee-bate programs for vehicles based on emissions	3	M	S
Sponsor a tax non-recyclable packaging	2	E	S
Lobby for multi-modal passes and/or tickets that work across transit systems. One implementation of this could be based on the use of personal transponders (similar to FasTrak system used at Bay Area toll plazas).	3	M	S
Lobby for a statewide Bullet train system that would connect the major metropolitan areas.	1	H	S
Lobby for extending BART down the Peninsula and also providing a line across the bay at the Dumbarton bridge instead of the proposed rail line.	1	M	S
Increase the frequency of Caltrain express trains.	1	H	S
Grade separations for Caltrain (to facilitate increase in Caltrain frequency, Bullet Trains, and cross bicycling and walking)	2	H	S
Build carbon offset option into DMV vehicle license renewal	3	H	S
Create state or local gas tax to purchase carbon credits	3	H	S

11) Potential Emissions Impact of Specific Tactics

Following are some examples of carbon emission reductions obtained from specific tactics. The percent reduction is calculated using the “What if model for transport” developed by the baseline committee.

Tactic (including a reachable, measurable goal in a 3 to 5 year time frame using various strategies)	Approximate percent reduction of total transport CO2 emissions from current level
1) Convert 10% of automobiles to green vehicles that get on average 50 mpg.	5%
2) Convert 10% of solo car commuters to public transit	2%
3) Reduce non-commute car travel by 10%	1%
4) Replace 20% of the commute with electronic travel (i.e. 1 day/week)	3%
5) Assuming air travel emissions are split equally between personal, business, and commercial transport, reduce passenger air travel by 20%	3%
6) Reduce City fleet emissions by 20% (current emissions are 3000 metric tons CO2Eq)	< 1%
7) Convert 20% of out of town commuters to Palo Alto residents	5%

GRTF Building Group Recommendations

Chris Bui, Tony Carrasco, David Coale, Sarah Connick, Cedric de La Beaujardiere, Dave Dockter, Kirsten Flynn, Amy French, Walt Hays, Jim Inglis, Tom Jordan, Elke MacGregor, Drew Maran, Jane Melia, Roy Nordblom III, Pete Pearne, Larry Perlin, Russ Reich, Susan Rosenberg, Jon Stoumen, John Tarlton

The Green Ribbon Task Force makes the following recommendations relating to the built environment to enable the City of Palo Alto to reduce Green house gas emissions. These are consistent with the Palo Alto Comprehensive Plan goals, policies and programs.

New Buildings and Renovations

1. Provide green building planning and building review advice and education by hiring new, training existing staff or using consultant time. Require senior building officials to be LEED (Leadership in Energy and Environmental Design) accredited and BIG (Build it Green) certified.
2. Provide green educational materials at planning and building department. Some examples might include:
 - a. Building Resource guides
 - b. Information on Green lenders
 - c. Energy Star and water-wise incentives
 - d. Information on nonprofit benefits, e.g., tax deduction for donation of building materials deconstructed for reuse rather than demolition.
 - e. Information on tax credits for energy-efficient and green building projects.
3. Require LEED points list to be printed on nonresidential permit drawings, and require an escalating number of points be met over a period of years.
4. Require BIG points list to be printed on residential permit drawings, and require an escalating number of points be met over a period of years.
5. Provide incentives or recognition for incorporating green building elements in both residential and nonresidential buildings.
6. Offer expedited reviews or lower costs for green energy projects. Examples of eligible projects might include:
 - Projects that exceed Title 24 guidelines by at least 15 percent.
 - Projects that incorporate radiant barriers for all new and re-roofing.
7. Allow specific exemptions to building guidelines when green elements are applied. For example, provide floor-area ratio allowances in cases where walls are built extra thick for energy efficiency. Likewise, allow some flexibility in setbacks to allow solar building orientation.

8. Establish special considerations for green building/high-performance building projects. In a vein similar to HIE (Home Improvement Exemption), consider creating a “Green Improvement Exemption” (GIE).
9. Build or establish more traffic reducing housing (TRH) in Palo Alto. For example, when selling or renting new apartments, condos, and town homes, select residents who commit to owning fewer cars and driving less.
10. Increase incentives for traffic-reducing commercial. For example, offer stipends for employees that live within a short distance of their work.

Energy Efficiency

1. Create a fund for energy efficiency consultants to address the needs of both large and small clients.
2. Encourage renewable power, such as photovoltaics.
3. Encourage energy-efficient water heating solutions, such as tankless and solar water heating.
4. Explore a residential energy consumption ordinance (RECO) similar to that in effect in the city of Berkeley, which requires an energy upgrade when a property changes hands or undergoes significant improvement.

Landscape

1. Increase ratio of trees to spaces in parking areas and in paved areas to prevent heat islands.
2. Implement water efficiency. Examples might include Xeriscaping, weather linked irrigation controllers, native plantings.
3. Implement trees planted optimally for building shading
4. Encourage aquifer replenishment. For example, require use of pervious concrete for paved areas or rainwater catchment.

Pedestrian & Transit Planning

1. Create more residential density downtown, near train stations, and at public transit corridors (e.g., El Camino Real).
2. Implement bike circulation and bike parking in all areas, and increase communication of bike routes and amenities.
3. Encourage outdoor seating and pedestrian access at commercial areas such as University Avenue and California Avenue, similar the City of Mountain View’s approach.
4. Reduce parking space requirements for well-located, high-density residential developments.

Global Warming Education/Motivation Committee Report

Mayor's Green Ribbon Task Force
City of Palo Alto, California

December 1, 2006

Participants:

Penny Barrett
Jim Burch
Peter Drekmeier
Carroll Harrington
Walter Hays
Jeff Hook
James Kao
Sandra Lonquist
Jerry Matranga
Debbie Mytels
Melinda Teves
Heather Trossman



We of the Palo Alto Green Ribbon Task Force Education/Motivation Committee see our role as integrators: packaging and disseminating information from and to existing communication networks within our city (we refer to these as “nodes”) rather than acting as an original source of information. Within the GRTF itself, our “source nodes” are the other subcommittees: Baseline, Buildings, Education, Energy, Transportation, and Waste Reduction. In the larger community our “source nodes” are city government, business, home and neighborhood, faith communities, schools, and civic and service organizations. A great deal of ongoing research, educational material, and strategies for addressing global climate change already exist within the GRTF and without. It is not our job to duplicate these efforts; rather we wish to put the various constituencies in touch with each other, to share knowledge and leverage greater collaboration in a united effort to reduce CO₂ emissions in our city and region.



I. Our Subcommittee Name

Since motivating people to change is a more complex and important task than simply “educating” them, we decided to call ourselves the “Education/Motivation Subcommittee”. The people of Palo Alto need to be informed about the science of global warming. We feel that education is best combined with immediate and specific green action, so that individuals feel invested in, and committed to, being part of the solution.

II. Education/Motivation Subcommittee Mission

1. Improve communication about “green” issues between community networks, segments or “nodes” within the city of Palo Alto.
2. Identify common goals and reinforce them. Encourage synergy by sharing existing ideas and programs.
3. Create a “bandwagon effect” by making the message about our community’s response to global warming constantly reinforced and visible everywhere. Create a sense of moral imperative about this issue.

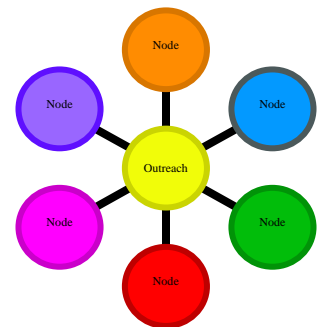
III. Education/Motivation Subcommittee Goals

1. Act as a “filter” for the findings of the other GRTF subcommittees (Baseline, Buildings, Education, Energy, Transportation, and Waste Reduction) which can be effectively communicated to the public.
2. Educate and motivate all segments of the Palo Alto community to take quantifiable action to reduce carbon emissions.
3. Identify and publicize the actions that people and organizations are now already doing about climate change.
4. Using the recommendations of the GRTF, synthesize and design a community awareness program.
5. Measure the results of this education/motivation program.
6. Honor the accomplishments of the community on a yearly basis.



IV. Findings

1. Like most communities, Palo Alto has many “nodes” of interaction, i.e., segments of the community in with which people interact regularly and identify. Many people find that their main source of “external” (non-family) information comes from such a communication node; some participate in more than one. To be effective in disseminating information and motivating action, we want to utilize these communication nodes as effectively as possible.
2. In Palo Alto, we believe that we can convey information to almost everyone by utilizing the communication vehicles that already exist in the following nodes:



- business community
 - school community
 - faith communities
 - neighborhood organizations
 - service clubs and community organizations
 - city government
3. In addition to having some things in common, each of these nodes has distinct needs and characteristics that require specific communications, both of information content and methods.

V. Recommendations

Create synergy, not duplication, between new and existing green activities.

1. To save time and resources, identify environmental actions that are already going on within each of the community nodes. To this end, identify a “lead organization” within each node, such as:

- Public Works--City of Palo Alto (several departments cover environmental issues)
- Chamber of Commerce – business community
- Sustainable Schools Committee – school community
- Palo Alto Ministerial Association (PAMA) – faith community
- PA Neighborhoods (PAN) – neighborhood organizations
- Other non-profits (including “green” groups like Acterra, Canopy; Sustainable Silicon Valley, and civic and service clubs like Rotary, Kiwanis, League of Women Voters, PAGE, AAUW, etc.

2. Ask the lead organization for each node to determine what is already going on within its segment of the community.

3. Create a computer database with info about the various organizational actions.

4. Encourage each node to come up with a “greening” plan for its segment of the community.

5. Encourage each segment of the community to adopt a “green certification” program. For example:

- The City Council and City staff has and continues to play a key leadership role in this effort. The City is already certified with the

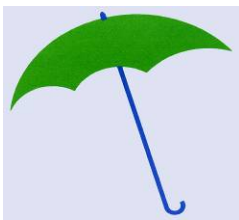
Santa Clara Green

Business Program, (part of the Bay Area Green Business Program, under the aegis of ABAG), which is described below. The City can set a good example with city buildings, vehicles and employee behaviors; by making climate change integral to our Comprehensive Plan, zoning, ARB review, and other legislative policies; by making city-wide media such as utility bills and the City of Palo Alto website available for dissemination of information, and by creating one or more new staff positions to support these activities.



- The Chamber of Commerce is starting “**Palo Alto Business Goes Green**” with the goal of getting more local businesses to achieve certification via the **Santa Clara County’s Bay Area Green Business Program**. This is the program under which the City of Palo Alto, Stanford University, Gunn High School, and about eleven businesses and non-profits (including Acterra) are currently “green certified”. Its “Office/Retail” checklist actually covers any entity that has a physical office, whether its facility is owned or rented, and thus is very flexible.
- Within the faith community, one denomination has a “**Green Sanctuary**” program; perhaps PAMA could encourage all its members to adopt something like this.
- Similarly, non-profit organizations and faith organizations that have a physical office might prefer to undertake the “Business Office” certification program of the Santa Clara County Green Business program.
- Acterra plans to begin a neighborhood outreach project to support residents in reducing their CO₂ emissions. Those who complete a home energy saving checklist will receive a decal in recognition of meeting this goal. Completing such a checklist (including signing up their household for PaloAlto**Green** alternative power) could be a type of “certification.”
- The Sustainable Schools Committee might come up with a similar certification program for schools within PAUSD as well as private schools and preschools, etc., or could use the certification program of the Santa Clara County Green Business program, like Gunn High School.

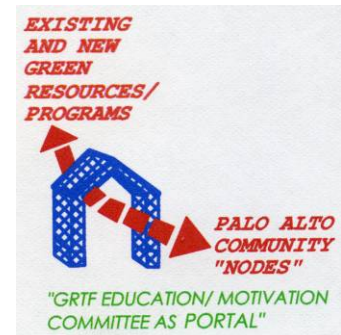
Create an overall “PR Umbrella” for Palo Alto green action.



- Create a name, logo and other branding for “Green Ribbon Task Force” activities. More ideas:
- Brand Palo Alto as “the Green City” or get permission to use “PaloAlto**Green**” as the umbrella logo, with a more inclusive graphic. There are many City departments with environmental activities, and it is confusing to navigate between them.
- Have a “Green” column in the PA Weekly, Daily News, and on-line news sources, such as PA On-line and PA TownSquare, BackFence, etc.
- Have a city-sponsored “Green” webpage that appeals to all community “nodes”.
- The webpage could include a Google Earth map that shows which houses are signed up for PaloAlto**Green** alternative power.
- Create an easy way for people and organizations to use the green logo and a tagline such as “I saved so many trees, \$\$ and carbon emissions by using recycled paper and soy ink” at the bottom of documents, stationery, invitations, etc.
- Publicize the need to reduce carbon emissions with billboards, contests, workshops.

To leverage the work that's already going on and integrate it with new green action, create a public/private partnership.

1. A helpful model for implementation might be the Family Resource Center, founded in 2000. A non-profit foundation partnering with the City of Palo Alto, it acts as a “portal” to family services for the community. It relies on a system of “ambassadors”, a website, and portable information kiosks about existing organizations and resources to communicate, educate, and refer.
2. Assign a part-time City staff person to this public/private partnership, to implement the recommendations of the Green Ribbon Task Force and to act as a “Portal” to green activities and information. The staff person would leverage the activities that are already going on, improve communication and coordination, and help people learn how to take action with the support of others.
3. The specific tasks of this City staff person would be to:
 - Implement the branding activities (get a volunteer branding team of marketing professionals, hold a logo design contest among students, etc.)
 - Identify the lead organizations within each node
 - Help these lead organizations to select and utilize a suitable certification program
 - Create the database of “greening” activities, including certification programs, that are going on in all the organizations and nodes within the community
 - Publicize opportunities to participate throughout the community and within nodes
 - Identify and train key communicators in each node regarding what’s going on so that they in turn can disseminate information to others
 - Collaborate with City of Palo Alto Utilities, the Baseline Subcommittee, media outlets and key communicators in the various nodes to publicize community progress on reducing CO₂ emissions
 - Identify any gaps in service or segments of the community that are not involved and engage them in adopting a suitable certification program or other “greening” activities, for example:
 1. What about people who commute here to work--will we reach them sufficiently via their business node? Note that Palo Alto’s population doubles during the workday.
 2. What about people who participate or are spectators in sports activities? Are there special things they can do to reduce emissions?



3. What about people who only come into Palo Alto to shop? The Farmer's Market, Stanford Shopping Center, Town & County Village, the Downtown Improvement District, and the other shopping districts are natural "nodes" for participation.
- In collaboration with each of the nodes, create city-wide recognition programs (such as awards events and displays in the libraries and/or city hall) to commend organizations and individuals for their CO₂ reduction efforts.



Acterra: Action for a Sustainable Earth

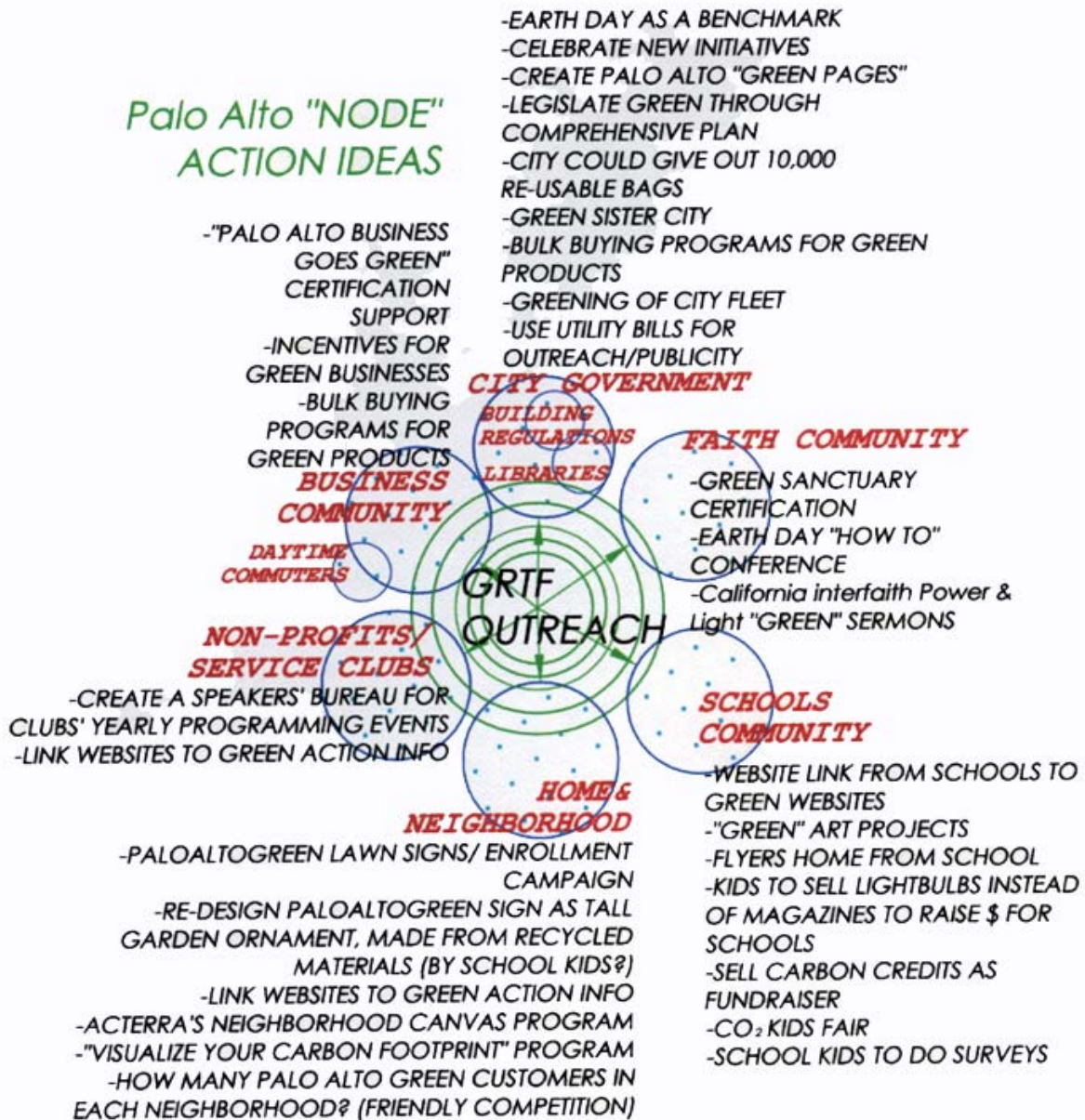
In general, it may make sense for the City of Palo Alto to consider Palo Alto environmental non-profit Acterra for the role of the non-profit portion of the public/private partnership the GRTF is recommending, rather than starting up a new non-profit from scratch that may duplicate some of Acterra's programs. As mentioned, Acterra is currently in the process of designing a neighborhood-based program about global warming. Whether or not Acterra becomes involved in Palo Alto follow-on activities in a more comprehensive way, it is committed to undertaking the program (dependent on funding). It is submitting a written proposal to the City of PA Utilities to provide funding for a pilot of this project. Other funding requests are in process.

The project will contain both an educational component ("what is global warming and how does your energy use relate to it?") and a practical, action-oriented approach (Acterra's Green@Home volunteers will perform 5 energy saving measures and go through a 10-point check list with the residents). Therefore this project will not only have immediate results in reducing CO₂ emissions, but will also raise individual and community awareness about the need for further, deeper cuts. Working through Palo Alto neighborhoods on a block-by-block basis and getting some "community buzz" going about the project will focus community attention, and lay the groundwork for community support of other initiatives as well. Acterra also intends to work with neighborhood associations to provide support and recognition for those who participate in its Green@Home action steps.



The following is a portion of the brainstorming chart of the Education/Motivation Committee in which we list possibilities for green action within the existing communication networks, or "nodes" of Palo Alto--

Education/Motivation Committee Brainstorm for Palo Alto Community Nodes:



End of Draft Report